THE BUILDER

VOL. XCIX.—No. 3525. AUGUST 27, 1910.

CONTENTS.

	PAGE
Chinese Paintings	231
Exhibition Buildings	233
Bill-Posting	234
Notes	234
Architectural Education at Home and Abroad (Part IX.)	236
Applique Work in Embroidery	237
Notes on Asphalt	237
Historical Buildings	239
Residence at Wimbledon	239
Competition News	240
Books	240
Legal Column	241
Foreign and Colonial	241
Fifty Years Ago	242
Correspondence	242
Intercommunication Column	242
Illustrations:—	
Roof and Screens, Church of St. Peter, Shorwell	242
Sketches with the Architectural Association Excursion	242
Chinese Paintings	242
Monthly Review of Engineering:—	
Reinforced Concrete and Terra-Cotta Office Building	243
Monthly Review of Engineering (*contd.*):—	
A High Retaining Wall in Reinforced Concrete	244
Inland Navigation Abroad	245
Forth and Clyde Ship Canal	246
Water Purification by Ozone	246
Notes	246
Dangerous Structures	249
London Councils	249
Projected New Buildings in the Provinces	249
Obituary	249
General Building News	250
Sanitary and Engineering News	250
Stained Glass and Decoration	250
Miscellaneous	250
Capital and Labour	251
Patents	251
List of Competitions, Contracts, etc., Open	252
Prices Current	254
Tenders	255

Illustrations.

Church of St. Peter, Shorwell, I.W.: New Roof and Chancel Screens. By Mr. Percy G. Stone.

Sketches with the Architectural Association Excursion. By Mr. C. Wontner Smith.

Chinese Paintings. From Photographs.

Illustrations in Text.

	PAGE
Chinese Paintings:—	
Sketch from part of a Painting of the VIIIth Century A.D., in the British Museum	231
Part of Painting, "The Earthly Paradise." Ming Dynasty	232
"Fairy Scattering Flowers." End of XVIIth Century	233
Applique Work in Embroidery:—	
Detail of Embroidered Super Frontal for S. John's, Paddington, by Miss B. A. Waldram	237
Embroidered Banner, by Miss B. A. Waldram	237
Notes on Asphalt: The Forrest Viscosimeter	237
Residence at Wimbledon:—	
Ground and First Floor Plans	239
View	240
Monthly Review of Engineering:—	
Reinforced Concrete and Terra-Cotta Office Building:—	
Offices, Infirmary-street, Leeds	243
Figs. 1 to 5	244
A High Retaining Wall in Reinforced Concrete:—	
Fig. 3. Forms of Indented Bar Used	244
Fig. 1. Retaining Wall	245
Fig 2. View of Back of Retaining Wall in Reinforced Concrete	245
Forth and Clyde Ship Canal	246
Liverpool Dock	247

Sketch from part of a Painting of the VIIIth Century A.D., in the British Museum.

THE importance of art as a factor in the body politic, as an influence in international relations, for instance, has never perhaps been more happily illustrated than at the exhibition of Chinese pictures at the British Museum. The exhibition has now been open some two months; it has been visited by a large number of persons, including artists and the type of people who create what is called a vogue. And there can be but few of those who have seen the pictures who have not to a large extent revised their view—formed largely, in most cases, of prejudice and preconceptions—of Chinese art and civilisation generally. Few indeed can have left the galleries without feeling that they had been in the presence of an extraordinary manifestation of the artistic spirit, a manifestation of an elaborate and classic character, in which great guiding artistic principles have been at work. Certainly such an exhibition must tend to improve the understanding with a people who are generally regarded with a sort of jocular disrespect.

We need make no excuse for not being familiar with Chinese pictorial art, because this is, we believe, the first important exhibition of Chinese pictures held in this country. Since 1881 the British Museum, which then came into possession of a private collection, has been adding steadily to its store. A few private persons have also been interested in Chinese work and formed collections. But to the world generally Chinese painting has been largely a blank page. Japanese art, on the other hand, is generally familiar, chiefly through colour prints; and it is indeed largely due to our familiarity with the Japanese convention that we are able to enter almost immediately into sympathy with the more ancient and greater art upon which it was founded. For we doubt that the Japanese, with all their gift of ready assimilation, their alertness and adaptability, have ever quite equalled the spacious convention from which

originally they drew their inspiration and teaching. In regarding the three walls of the Print Room gallery, devoted entirely to Chinese work, it is necessary to remember perhaps that, thanks to Mr. Sidney Colvin and Mr. Laurence Binyon, we are in the presence of a very careful and scholarly selection.

The earliest examples of Buddhist art shown are a small preliminary selection from the paintings discovered by Dr. M. Aurel Stein in 1907, in Tun-huang, Turkestan, in a vault which appears to have been sealed up a little after the year A.D. 1000. Most, if not all, of these paintings belong to the period (A.D. 600 to 900) of the T'ang Dynasty, the era of the empire's greatest power and widest expansion, the time of its greatest poets and of its supreme painter. For by universal consent, according to Mr. Binyon, Wu Taotzŭ has been ranked above all other artists of his race, though no work is known to exist, unless in China, which can be ascribed to him with certainty. The paintings from the Stein Collection are of the highest archæological importance as representing the prevailing methods and practice of Buddhist art during this period. It is noteworthy, however, as modifying theories hitherto generally accepted, that in the narrative scenes from the Buddha legend —as distinguished from the single hieratic figures—types, conventions, and treatment have become entirely Chinese, with scarcely a trace of Indian character remaining. These scenes anticipate also the conventions of the Tosa School of Japan. The paintings of later date, forming the main body of the exhibition, are mainly from the collection formed by Frau Olga-Julia Wegener during a residence of several winters in China. This fine acquisition was made possible chiefly through the generosity of a body of private subscribers contributing to the purchase through the National Art Collections Fund. The periods represented are those of the Sung Dynasty, 960-1280; the Yüan Dynasty, 1280–1368; the Ming Dynasty, 1368–1644; the Ch'ing Dynasty, 1644 to the present day.

The three walls which embrace the art production of so many centuries convey an astonishing impression of artistic unity. We may be able to trace, with the help of Mr. Binyon's excellent catalogue, certain deviations in artistic quality, one period which has more distinguished qualities than another; but there has been little change throughout the centuries of artistic formula. The preservation of this continuity is surely one of the most remarkable of artistic phenomena. And in these pictures, as a whole, we find a sustained boldness of artistic outlook, a spacious feeling for composition, a sensitive appreciation of colour, and a mastery of form which make one wonder to what extent and how far the art of Greece penetrated into the East. The influences of the nearer East, of India, are apparent, notably in the beautiful picture, No. 39, entitled "Kwanyin, the Goddess of Mercy," by an unknown painter of the Yüan Dynasty (1280-1368). Behind an admirable pictorial convention, or rather incorporated with it, there is an interpretation of life and natural forms equally broad and interesting. It would be absurd not to admit that the Chinese convention offers some difficulties to the Western mind, particularly in the treatment of the figure and in the decorative formula with which certain aspects of nature are portrayed It is not a little curious indeed to remark how an intensely realistic feeling for form, movement, and expression (as in the birds and animals—see, for example, the Tiger, No. 61)—is displayed concurrently with a preconceived decorative formula in other matters, in which personal observation can scarcely have been of much account. In the early art of the Chinese, as in the early art of other races, we find illustrated the incidents of mythology, religious story and history; but as the art progresses the interest of storied incident becomes of less concern. In its place we find an art of a more abstract character.

Part of Painting, "The Earthly Paradise." Ming Dynasty.

It is probably due to an intelligent acceptance of what a picture can and cannot express, to the rejection of ideas proper to the chronicler or historian, or to other forms of art, that the Chinese have advanced so far. So we have all these charming portrayals of birds and animals, of trees and flowers, of mountains and gorges, of sages and fair women, all more or less of a lyric character. And here, as indeed is nearly always the case when artistic expression is perfectly subordinated to its conditions, in the very definiteness and logic of its formula, there is an elusive quality which we will not now attempt to define, but which is common to all art that endures. Space forbids any historic comparison of the early arts of the East and the West of the same periods, interesting as it would be for Europeans to render homage to an understanding of pictorial methods which is certainly as great, if not greater. But one or two such comparisons are so obvious as to demand statement. Take, for example, picture No. 95, with the title, "Fairy Scattering Flowers," painted by Hsü Mei towards the end of the XVIIth century; and observe how closely related this is to the Italian or Flemish work of a somewhat earlier period; again, the large picture on the first screen, certainly to Western eyes the most beautiful at the exhibition, "The Earthly Paradise," attributed in the catalogue to the late XVth or early XVIth century, which in its poetic charm and gaiety of feeling suggests the spirit, even something, although remotely, of the formula of Botticelli.

Chinese art, as represented at the present exhibition, would seem to indicate that it attained long ago a perfection within its formula at which it must rest.

"Fairy Scattering Flowers." End of XVIIth Century.

Will it rest there? Will it attempt to assimilate European ideas with the same unfortunate artistic result as in the case of Japanese? We confess that we are wholly ignorant of the incidents of Chinese history, but, so far as we are able to estimate its history from its art, we should imagine that the temper of the people, being indifferent to what is called the "advance of civilisation," to the hurry, competition and invention, which we all find so interesting, possesses nevertheless certain qualities which have only found individual expression, and then rarely and with much credit, in the apparently more turbulent civilisation of the artistic nations of Europe.

Our illustrations are taken from Mr. Lumley Cator's photographs, the only series obtainable, two of these will be found in our inset plates.

Abbaye de Solesmes.

WE read that this highly interesting church, through its purchase by a local proprietor, the Marquis de Juigné, is rescued from the fate that threatened it. The abbey, standing on the bank of the Sarthe, near Le Mans, has been latterly occupied by some Benedictine monks. It is remarkable for the four groups of statues—known as *Les Saintes de Solesmes*—set in niches within a sculptured framework after the Gothico-Renaissance style. Above the recess of the Entombment group is an ogee-arch, bearing date 1496, richly decorated with mallow and thistle foliage; in the choir and the north transept are the Communion and the Death of the Virgin. The sculptures have been variously attributed to Germain Pilon and other French artists.

EXHIBITION BUILDINGS.

OUR article of last week sufficiently indicates the facilities provided at the Brussels Exhibition for the beginning and rapid spread of fire. The liberal employment of canvas and other textile fabrics as structural and decorative materials doubtless served to render the sections affected even more than usually vulnerable, but apart from this characteristic there is no reason for believing the average exhibition to be much safer from fire than that which has paid so heavy a price for attempted economy.

In almost every case exhibition buildings of moderate dimensions consist of a light timber framework either cased by painted canvas or covered by thin boarding faced with a combination of canvas and plaster of Paris, and finished by timber roofing, floors, and interior partitions. Larger buildings embody a framework of the lightest possible steel sections, generally boarded in, and decorated with the customary plaster work. The roof principals may be of steel, but the purlins, rafters, and covering are mainly of timber, a material also prominent in the interior fittings.

Nothing need be said concerning the fire assistance furnished by a temporary structure of the first class, as its peculiarly combustible nature is perfectly self-evident. It may, however, be supposed by some that a steel frame offers a greater measure of protection. That may be so to a limited extent, but, as shown in very striking fashion by the photograph reproduced on page 204 of our last issue, the effect of high temperature is absolutely fatal to steelwork, speedily reducing light and graceful structures to twisted and tangled ruins.

No exhibition within recent times has been better conceived from the structural point of view than the Paris Exposition of 1900, where numerous important buildings were constructed entirely in reinforced concrete so as to afford safe accommodation for artistic, historical, and other treasures beyond all price. The example thus set is one that should always be followed, regardless of cost, and it is one that ought also to be applied to the housing of materials and manufactured products which are of specially combustible character. Such objects should either be collected together in large isolated pavilions at different points, or if more convenient for the purposes of classification they might be housed in fire-resisting apartments formed inside the building allotted to the exhibits of any given country or devoted to a particular section of the exhibition. The adoption of this policy would evidently be of value in protecting priceless heirlooms from destruction and in reducing fire risks generally.

Other exhibits also require reasonable protection which we do not for a moment believe to be incompatible with financial requirements. A machinery hall, for instance, need not be more combustible than the products it is designed to shelter. For the building nothing more is required than a steel frame with incombustible wall panels, roof covering, and glazing. These present no difficulty and entail no burdensome outlay. Given correct lines and neatly-executed finish, the structure would be strictly appropriate to its intended use, and in harmony with the exhibits themselves. To disguise such a building in plaster of Paris decorations of the wedding-cake variety, as too frequently happens, is useless expense and a desecration of art.

In providing the requisite accommodation for general exhibits, not involving abnormal fire risks, the main thing is to construct buildings (preferably in the form of separate pavilions as suggested in our previous article) which offer no encouragement to any local outbreak of fire. This means that we must break finally with the traditional flimsy structure of wood canvas and plaster. Steel is quite permissible if inexpensively sheathed in fire-protective casing, and is essential in roof construction. But timber wall panels, interior partitions, floors, roof framing, and roof covering must be given up. Expanded metal, wire netting, and steel lathing can easily be stretched between the main stanchions as the basis for incombustible walls and partitions formed of cement, mortar, or fire-resisting plaster. Sheets of fire-resisting material and thin partition slabs, of which many are on the market, constitute equally suitable alternatives. Flooring presents no difficulty, while incombustible roof framing and covering can be provided as readily and as cheaply as timber and tarred felt. By means of construction on these lines, with the addition of fire-partitions and fire-doors, and the free use of wired-glass, the risk at present incurred would be almost entirely obviated, and it is probable that the saving of insurance premiums would very nearly repay the additional outlay involved by rational construction.

Of course, we assume equal care in the design of show-cases, exhibitors' stands, and small temporary buildings included as exhibits; and the provision of fire-fighting appliances, including sprinkler installations in all departments devoted to combustible goods, is by no means to be neglected.

Being convinced that reasonably safe, and for some purposes entirely fire-resisting, buildings are absolutely essential for all temporary exhibitions, and at the same time that such structures do not entail prohibitive expenditure, we propose in subsequent articles to give details of some exhibition buildings which have already been erected in compliance with the dictates of prudence, and to deal also with methods and materials of construction suitable for application to buildings of the same class. The subject is one of general interest to architects and the public alike, and, as shown by the Brussels disaster, it may on occasion assume national and even international importance.

Brussels, and "Villette."

WE learn that Rue d'Isabelle is in course of being demolished to make way for a local improvement, and that No. 34—it was formerly No. 32—will shortly be pulled down. The house, now a boys' school, retains many of the rooms, with the garden and other features, as they were in Charlotte Brontë's time (1841-2) and when the *pensionnat* was kept by M. and Mme. Héger. After their death the municipal authorities purchased the property.

BILL-POSTING.

THE hoarding, with its gaily-coloured array of popular pictures, some of which frequently display artistic merits of a high order, is, although more usually an ephemeral feature in the street picture of the city, none the less one that has to be reckoned with as part of the whole question of civic amenity. It also forms, of course, but one factor in the problem of the admissibility of advertisement; but this is not the aspect from which to regard it here; the æsthetic side of the question is our sole concern; and, in dealing with this, we must not take too narrow a view by insisting that the poster must necessarily be subordinated to an architectural scheme.

Mr. W. H. Lever, in offering prizes for the best bill-posting stations constructed from an architectural point of view, has shown his recognised alertness in seizing on a defect in our methods, and his customary promptness in making an effort towards improvement. From whom could suggestions in this direction come more appropriately than from one who has been so large a patron of the art of the poster, and whose work at Port Sunlight has led him to take the keenest interest in the possibilities of beauty in our towns?

With the strongest sympathy for Mr. Lever's aspirations, and while we are in entire agreement with his views in regard to permanent advertising stations, which should undoubtedly have an architectural frame designed in harmony with the surroundings and displaying the posters much in the same way as attractive merchandise is shown in skilfully-arranged shop windows, we would yet sound a note of warning in regard to the obviously temporary hoarding, which ought not to simulate the character of permanence. We do not mean that it should be regarded, as it too often is, simply as an area to be covered haphazard with bills of all shapes and sizes. The spacing out and framing up with margins decorated or otherwise should be carefully studied, but to attempt to give such an ephemeral structure the characteristics of a substantial architecturally-designed erection would be a grave error.

At most it is merely a screen, and only the forms appropriate to a screen should be admitted; better the impression of a canvas stretched between poles, such as we see at a fair, than an elaborate composition, including pilasters, entablatures, balustrades, and the like. Take, for example, the temporary street decorations erected in compliment to illustrious visitors or on festal days; how much more satisfactory are these when graceful lines and pleasant distribution of colour are obtained by simple means than when they take the shape of ambitious efforts in more architectural forms.

The same principles hold good with regard to temporary hoardings—which are, moreover, to some extent allied to building scaffolds, and these being recognised as purely utilitarian, a too sophisticated treatment of the hoarding would only serve to enhance the discord between it and the scaffold; whereas, with the hoarding treated simply, this would not be felt. The effect of scaffolding is frequently picturesque, and the temporary hoarding, judiciously coloured and with well-spaced posters, would take its place better in the general scheme than if it were treated on the architectural lines suited to a permanent structure.

We think that Mr. Lever would be well advised to divide his four prizes into two sections—giving the more important to designs for permanent positions, and the other two for the treatment of temporary hoardings.

NOTES.

Garden Suburb Competition, Romford.

IT is proposed to hold an important architectural and building competition in connexion with a Town Planning and Modern House and Cottage Exhibition next summer at Gidea Park, Squirrels Heath, where a Town Planning scheme was recently inaugurated by the President of the Local Government Board, the Rt. Hon. John Burns. Mr. H. H. Raphael, M.P., who some years ago presented to Romford the fine public park which bears his name, has offered a thousand guineas in prizes for the best designed houses and cottages erected in the exhibition, and for a site plan and other designs. The gold medal of the exhibition and 250*l.* will be awarded for the best detached house, the building cost of which is not more than 500*l.* Another gold medal and 200*l.* will be given for the best cottage, costing not more than 375*l.*, and a number of other valuable prizes will be awarded, including two allotted to the builders for excellence of workmanship and construction. The directors of the Romford Garden Suburb intend to purchase twelve of the houses and cottages erected by exhibitors. Arrangements are also being made by which at least three-quarters of the cost of the erection of all competition houses will be advanced to competitors. It is thought if any substantial improvement is to be made in the appearance of Outer London, it can only be done by improving the design of houses of the class which is generally in demand. In recent years probably nine-tenths of the houses newly erected in the eastern suburbs of London would fall within the cost limit laid down for competitors in this exhibition, and it is to be hoped that the exhibition will set a standard of architectural design, and of internal comfort and convenience, which will do much to improve the growth of the development of Outer London. Mr. Guy Dawber, Vice-President of the Royal Institute of British Architects, Mr. H. V. Lanchester, F.R.I.B.A., and Mr. Mervyn Macartney, F.R.I.B.A., F.S.A., will act as judges, and it is to be hoped that the generosity of Mr. Raphael will meet with a wide response in entries from members of the architectural profession. To younger members of the profession such a competition affords opportunities which they will not be slow to appreciate, but the occasion is one which makes it very desirable that the best architectural skill in domestic architecture should be made available to assist in an endeavour to improve the architectural conditions under which nine-tenths of the population in the outer suburbs at present reside. Designs must be submitted not later than October 31. And from these a selection will be made of such as are suited to the general lines on which the estate is being developed, and facilities will be given for the erection of those chosen. The full conditions can be obtained on application to the Secretary of the Town Planning and Modern House and Cottage Exhibition, 33, Henrietta-street, Strand, W.C. The Romford Garden Suburb adjoins the Squirrels Heath and Gidea Park Station on the Great Eastern main line, which will be opened in December.

Wakefield Tower, Tower of London.

THE Wakefield Tower has been closed during some months for its structural alteration by the Office of Works, with a view to the custody and better display of the Regalia, which was removed thither from the Martin, or Jewel, Tower forty years ago. From its proximity to the great hall of the Palace within the Inner Ballium or Ward and its use for the deposit of State records, it was known also as the Hall, or Record, Tower. Captives were confined therein after the battle of Wakefield; it was the prison-lodging of Lords Lovat, Kilmarnock, and Balmerino. The fabric is worthy of notice, for the lower story is next in antiquity to Gundulph's Keep or White Tower. From its north and east sides extended formerly two curtain walls to Coldharbour and Lanthorn Towers respectively.* It is cylindrical on plan, 50 ft. in diameter, with two stages (there were originally three) rising to about 50 ft. In the lower stage is an octagonal chamber on the ground level, 10 ft. high and 23 ft. from face to face, with walls 13½ ft. thick. In the faces are deep round-headed recesses, some of which have loops. The flat timber ceiling is apparently coeval with the rebuilding of the upper floor *temp.* Henry III. The upper room, also octagonal, 30 ft. in diameter, has seven recesses, each with a drop-arch carried by a plain chamfered rib. The half-octagon pillars in the angles seem to indicate an actual, or intended, vaulting—the flat ceiling is now 25 ft. above the floor. In the north-east recess is the "Chapel in the New Tower," cited in 1238, being the oratory in which Henry VI.'s body was found. The present entrance is an exterior addition made on the north side; it contains a well-stair, 6½ ft. in diameter, that ascends to the first floor and the battlements. The masonry of the lower portion, late Norman, is of ashlar, finely jointed, and with a rare precision; the uncoursed rubble of the upper part has been pointed and encrusted with flint chips. A. Salvin restored Wakefield Tower in 1867-9 for the reception of the Crown jewels; some interesting water-colours, 1801, by C. Tomkins, showing its interior as fitted up for the records, are in the "Crowle" Pennant.

Bloomsbury Houses.

FREQUENTERS of Bloomsbury have noticed with interest the disclosure, consequent on the demolition of premises

* Confer W. Haiward's and J. Gascoyne's large scale bird's-eye view of 1597; C. Lempriere's plan, 1726, engraved by J. Basire; and H. W. Brewer's drawing (published in the *Builder*, January 3, 1885) of the Tower in the time of Elizabeth.

in Southampton-row, of the very picturesque backs of the old Queen Anne houses in Gloucester-street, which leads from Theobald's-road to Queen-square. The hipped tiled roofs and dormer windows of these houses, appearing over the hoarding, have formed for some weeks a very unusual and refreshing termination to Great Russell-street; but now the steel stanchions of a building of shops, offices, and flats to the same scale as the rest of that side of Southampton-row are beginning to obscure the view of this old work, so pleasing and profitable for sketcher and photographer. Less known are similar demolitions in New North-street, exposing the backs of houses in Devonshire-street, which also leads into Queen-square, and is of the same date as the square and Gloucester-street. These two narrow old streets, once so fashionable, especially Devonshire-street, on account of its proximity to the Sardinian Chapel, and now so dilapidated, give, even in their squalor, as correct an impression of the narrow cobbled ways and small-scale houses of Queen Anne's day as anything we know. Relics of this period, which have so long given the square and its purlieus an atmosphere, unusually complete, of a bygone day, are fast disappearing. The new wing of the Homœopathic Hospital, from which the scaffolding will shortly be taken down, at the corner of Great Ormond-street, supplanted premises which, if not so old as many near by, were, at any rate, not flagrantly out of keeping with the spirit of the square. The new wing of the Children's Hospital in Great Ormond-street took the place of others. Just opposite this, Nos. 37 and 39 are in difficulties consequent on the suspicions of the surveyor being aroused by the sudden "fainting," in Mr. Punch's phrase, of a house of the same period further along the street, some six weeks ago. The brickwork of these houses, which date from 1703, may in many places be taken down by hand aided by gentle taps of the hammer, and it is found that the appearance of sparse Flemish bond which the exterior bears is due to the introduction of a course of bats now and again in the 14-in. wall. It is not to be wondered at that houses built in this way "faint" when deprived of the support of their neighbours.

"Restoration" in Devonshire. THE destruction of the nave roof at Stockleigh English seems to have been an exceptionally uncalled-for proceeding and is a proof that the energetic "Anti-Scrape" propaganda has yet to penetrate the more remote parts of the country. It appears that a local carpenter was instructed to repair the old carved oak roof, but having reported it as past patching up, received orders to substitute a roof of pitch-pine. According to all accounts the breaking up of the so-called "rotten" roof was a most arduous task, and Mr. Harry Hems, who has taken the trouble to visit the church, and also to inspect the wreckage of the old roof, noted that among the material sold by the churchwarden was a hundred feet or so of well-carved pierced cresting which ornamented the main timbers of the roof. He describes this as an excellent example of the best type of XVth century work, and as a general result of his investigations came to the conclusion that the roof was not decayed to any material extent, and that, despite the rough handling it had received when torn down, it was not irretrievably ruined, and could be rebuilt by anyone who sufficiently appreciated its very real merits. So much for the policy of leaving our valuable antiquities in the hands of the churchwarden and the village carpenter.

Pictures. EVEN in the larger towns of the provinces the permanent collections at the present time, just before their interest is obscured and in some cases their houses occupied by the autumn exhibitions, possess for those who enjoy them and desire yet again to see the good things they contain an unusual attraction. But in London, at the moment, it is a case of a strong revival of regard, consequent on the closing of the annual exhibitions and the "one-man shows." The National Gallery, of course, South Kensington and the Wallace Collection, are sufficiently well known. But, we wonder, does Mr. Tennant's collection in his house in Queen Anne's-gate enjoy the popularity it deserves? To many it will probably be as new a thing, filled with the English masters in their never-failing freshness of appeal, as any of the annual shows. The collection is not large, containing, as it does, but thirty-seven catalogued canvases, of which nearly a quarter are by Reynolds, including his famous "Lady Crosbie" and "Kitty Fische." The Hoppners include the "Frankland Sisters" and the "Jessamy Bride." There are Gainsboroughs and Romneys, four of each, including one of the many "Lady Hamiltons," Turner's "Burning Houses of Parliament," and Constable's "Opening of Waterloo Bridge." Altogether a collection to be seen, as it may be on Wednesday and Saturday afternoons. The pictures at the Japan-British Exhibition, while not to be compared with the collection at the Franco-British, are yet not unworthy of a visit. The Black-and-White Room is strong in its representative endeavour, and amongst much dross in the water-colours and oils are many pieces of a very high order. Burne-Jones and others of the P.R.B. are represented, with some older masters. There is a curious collection of Trafalgar pictures lent by his late Majesty, some interesting old masters, and among the moderns many good things, of which two pieces by E. A. Walton and Clara Montalba gave us especial pleasure. In this connexion perhaps a reminder of the enchanting museum of Sir John Soane in Lincoln's Inn-fields will not come amiss. If you are for pictures, here, hidden away, two or three deep, in hinged frames contrived by Sir John, as solution of his difficulties with the discrepancy between the area of his treasures and of his walls, is the finest collection of Hogarths to be found, he believes, in any one place, including the eight pictures of the Rake's Progress. Here also are some fine Canalettos and many pieces by Flaxman, with innumerable engravings from, and studies and sketches by, other masters. It is a pity this museum is not open on Saturdays as well as other weekdays during the summer months when it is open at all, and a greater pity that it should be closed in the winter altogether.

Moving a XIVth Century Church Tower. IN the German town of Bocholt two American engineers are now engaged in the task of removing the church tower for the distance of some 30 ft. from the position the fabric has occupied for the last 600 years. The object in view is to permit the enlargement of the church. New foundations have been constructed for the tower, which is being moved along a specially prepared track at the rate of about 4 ft. a day. It is stated that only eight men are engaged in the operation, the dead weight of the tower being more than 2,500 tons. While not approving the principle of splitting up ancient buildings in the way that is evidently being adopted at Bocholt, we certainly think the bodily removal of structures might be more frequently adopted in the United Kingdom than it has been up to the present time.

Memorial to the Duke of Devonshire. WE understand that the memorial statue of the late Duke of Devonshire at the Whitehall end of Horse Guards-avenue will soon be finished. The foundation to the 10-ft. square base is laid down, and the statue of the late Duke in full Garter attire, by Mr. Henry Hampton, is almost ready to leave the foundry. The pedestal—some 13 ft. high—is to be appropriately of Derbyshire stone. It is hoped that the monument will be ready to be unveiled early in October.

Yorkshire Archæological Society's Outing.

WHEN the outings of archæological societies, accounts of which pour in on every side during the summer months, can enjoy the advantage of possessing such a *cicerone* as Mr. John Bilson, these excursions are bound to be of more than usual interest. The Yorkshire Archæological Society were in this happy position last month. At Bridlington Priory he called up before their imagination the splendid XIIth-century church, of which the existing one was but the nave, with a tower rising at the crossing and a choir terminating in five chapels, with a high reredos-screen and small alabaster reredoses in the chapels. He put forward the theory that to some extent the earlier church was allowed to stand till the greater one built round it was complete. Mr. Bilson pointed out the differences between the churches of the Wold and of Holderness. In the former and poorer district they were usually aisleless, a type of plan which some still retain. Many of them possess interesting fonts of cylindrical form, decorated with lozenge and similar patterns. In Holderness the ruthless Norman devastation and a subsequent return to prosperity resulted in much greater alteration to the churches. In the church at Barmston he identified the fine altar tomb which formerly stood before the altar, and is now removed into a corner with that of a member of the Monseau family, who died in 1446.

Welsh Monuments.

THE Royal Commission of Inquiry into the Ancient Monuments of Wales and Monmouthshire have just issued their first Report, covering the period from August, 1908, to the end of last year. They will shortly publish their first schedule of monuments, being those in Montgomeryshire. The report explains in detail the steps which have been pursued in order to frame a full list of the antiquities, with their classification, mainly as pursued some while since by the Congress of Archæological Societies.

C

ARCHITECTURAL EDUCATION AT HOME AND ABROAD.

By Alfred W. S. Cross, M.A.

Part IX.

In arranging the curricula of work at the various schools of architecture throughout the kingdom special care has been taken to include the subjects required for the qualifying examination either as probationer, student, or associate of the Royal Institute of British Architects.

And as the courses of study at the schools are thus dependent, to a large extent, upon the requirements of the Board of Examiners, it will be only fair to those responsible for the arrangement of these studies to review briefly the aim and scope of the examinations conducted by the Royal Institute of British Architects before comparing the educational methods of the various teaching centres.

The Royal Institute of British Architects desires to obtain from all those entering the profession a systematic course of education tested by progressive examinations, the passing of which forms the primary qualification for admission to its class of associates. By careful preparation on the proper lines, a youth, even before entering an office, may acquire enough of the rudiments of professional education to submit to an examination testing his capacity for the career of an architect; and if he passes it he may then follow a continuous series of studies, in accordance with a definite programme, thereby laying a foundation of artistic and scientific knowledge upon which to cultivate any natural gifts and develop any aptitude for invention or design he may possess.

The examinations are in three stages: (I.) Preliminary, (II.) Intermediate, and (III.) Final, qualifying for the grade of probationer, student, and associate respectively. These examinations have been so arranged as to induce the gradual development of artistic and scientific powers, to secure a systematic training in the art and science of architecture, from the entry into an office until the commencement of actual practice. They afford guidance in professional studies and opportunities for testing, at well-marked intervals, the progress made. A minimum standard of progress may be thus attained by all who enter the profession, which will serve as a basis for the further studies essential to the fuller development of architectural ability.

I. The Preliminary Examination (Written and Graphic) is to test the general knowledge of candidates in ordinary subjects of school education, and subjects of a technical character, such as Elementary Mechanics and Physics, Geometrical Drawing, Perspective, and Freehand Drawing from the Round. Exemption from attending this examination is granted to applicants who submit satisfactory drawings, and certificates from well-known educational bodies. A youth who is thus officially exempted or who passes the Preliminary Examination is registered as a Probationer of the Royal Institute of British Architects.

II. The Intermediate Examination (Written, Graphic, and Oral) is to test the probationer's progress in architecture while engaged as a pupil, improver, or assistant in an office. During the period following his registration as a probationer he has to prepare nine sheets of carefully-finished drawings, with an illustrated memoir. If these "Testimonies of Study" be approved, and if he afterwards pass the Intermediate Examination, he is registered as a Student of the Royal Institute of British Architects.

III. The Final Examination (Written, Graphic, and Oral) is to test the Student's further progress. The work to be done by the Student, and submitted by him before entering, necessitates good draughtsmanship and an acquaintance with ancient edifices or other well-known executed works, to be gained by actual measurement of them. It requires a knowledge of design and of the practical details of construction, which latter can be best obtained by personal experience of buildings in progress. The "Testimonies of Study," with the concurrent work of preparation for this examination, should occupy the student not less than three years; and no one can be admitted to it under the age of twenty-one years, although in most cases it will probably be found desirable that he should have attained the age of at least twenty-two before presenting himself. If the student pass, he becomes qualified for candidature as Associate of the Royal Institute of British Architects, and receives notification thereof. In the event of any student failing to pass the Final Examination within four years of having passed the Intermediate, his name will be removed from the Register of Students unless the Council is satisfied that good cause exists or allowing it to remain.

The "Testimonies of Study" are examined by the Board which decides whether an applicant shall be admitted.

The subjects for examination are distributed among individual members of the Board, who set the questions, examine the drawings and papers, and assign the marks in each subject. The oral examinations are conducted by the Board.

The Preliminary Examination.

To qualify for Registration as Probationer R.I.B.A.

Subjects of Examination.

1. Short English Composition.
2. Writing from Dictation.
3. Arithmetic, Algebra, and Elements of Plane Geometry.
4. Geography and History.
5. Latin, French, or German; one language to be selected by the applicant.
6. Geometrical Drawing or Elements of Perspective, either subject to be selected by the applicant.
7. Elementary Mechanics and Physics.
8. Freehand Drawing from the Round.

The Intermediate Examination.

To qualify for the Registration as Student R.I.B.A.

A Probationer R.I.B.A. who has attained the age of at least nineteen years and who is desirous of qualifying for registration as Student R.I.B.A. must make an application on the official form (to be obtained at the office of the Institute), and he must also send with his application "Testimonies of Study" as hereinafter set forth, accompanied by a certificate from a member of the Royal Institute of British Architects or other person of recognised position that the Probationer is a proper person to be admitted to the examination, and that the "Testimonies of Study" he submits are his own work.

The Examination comprises the following subjects, viz.:—

1. Classic Architecture.
2. Mediæval Architecture.
3. Renaissance Architecture.
4. General History of Architecture and the purpose of architectural features in relation to the buildings in which they occur.
5. Theoretical Construction; Stresses, Strains, and Strength of Materials.
6. Descriptive Geometry; the Projection of Solids.
7. Elementary Applied Construction, and the nature and use of ordinary building materials.

The "Testimonies of Study" required from Probationers R.I.B.A. must consist of nine sheets of drawings, and the sheets 1 to 6 must be accompanied by a written description illustrated by sketches. The subjects of the nine sheets of drawings must be as follows:—

1 & 2. Two sheets giving examples of any two of the Orders of Architecture drawn in outline, with the ornaments and enrichments filled in; each sheet to contain two columns of one Order with entablature complete drawn to scale, and details to three times the scale of the columns.

3. One sheet of details of Classic Ornament from the round.

4 & 5. Two sheets containing examples of any two of the periods here named—the Early English, the Decorated or the Perpendicular, such as a door, a window, or an arcade in plan, elevation, and section, with details of mouldings and ornament relating to such examples.

6. One sheet of Mediæval Ornament—freehand drawing from the round.

A concise account, giving such particulars as may be accessible, of the building or buildings from which several the subjects are taken, with the dates of erection and other details, illustrated by sketches of plan, general elevation, etc.

7. One sheet containing diagrams of a timber-framed roof truss, not less than 30 ft. span, with the nature of the strain on the several parts marked thereon, the ironwork and the junction of the timbers drawn to the scale of 1½ in. to the foot in isometrical projection and dissociated.

8. One sheet showing the construction of floors. Framed timber, combined iron and timber, and fire-resisting materials.

9. One sheet of details of joiner's work in doors, windows, and fittings, shown in plan, elevation, and section.

The Final Examination.

To qualify the Student for candidature as Associate R.I.B.A.

A Student R.I.B.A. who has attained the age of at least twenty-one years, and who is desirous of qualifying for candidature as Associate R.I.B.A., must make an application on the official form to be filled up as directed thereon. He must also send with his application "Testimonies of Study" as hereinafter set forth, accompanied by a certificate from a member of the Royal Institute, or other person of recognised position, that the Student is a proper person to be admitted to this examination, and that the "Testimonies of Study" he submits are his own work.

The "Testimonies of Study" required from the Students R.I.B.A. are:—

1. A study of ornament from the round, shaded.

2. A design for a building of moderate dimensions, such as a detached villa, parsonage, school, local institution, or cottage hospital, to be fully drawn out as working drawings, to a scale of not less than ¼ in. to the foot, in plans, elevations, and sections, duly figured, and showing the construction, drainage, with details of the construction and ornament, and a perspective view.

3. Drawings of some historical building, or part of a building, made from actual measurement, with the jointing of the masonry, etc., correctly shown, and the construction; the whole in plan, elevation, and section carefully figured, with details at least one-quarter full size. The original sketches measured and plotted on the spot are to be appended.

4. One sheet of diagrams of constructive masonry or brickwork, such as arches or groined vaults, with the projection of arch and vault stones.

5. One sheet of diagrams of a roof truss of iron or steel, not less than 40 ft. span, with details to a large scale, with all the calculations for strength at the various parts fully worked out and appended thereto.

The subjects of examination are as follows, viz.:—

1. Design of a building of moderate dimensions or a portion of a more important edifice, to be made from particulars given.
2. The Principles of Architecture; the Theory and Application.
3. The Nature and Properties of Building Materials.
4. The Arrangement and Construction of Buildings in relation to health, drainage, water-supply, ventilation, lighting, and heating.
5. Specifications and Estimating.
6. Construction.

Having completed our review of the schemes of architectural study formulated at the more important of the teaching centres throughout the country, the attitude of the public towards art in general and architecture in particular calls for a few remarks.

For years past members of the architectural profession have been complacently assuring each other that the advancement of architecture is dependent in a large measure upon the better education of the public in this particular form of art.

In other words, when a higher standing of architectural work is in demand by the public it is confidently expected that it will be forthcoming from the practitioners of architecture.

I am unable to share this optimistic feeling, because the proposition, although sound enough when applied to the question of supply and demand in commercial pursuits, is not applicable to the case in point.

Let us not deceive ourselves—a natural love for art is possibly inherent in some people and may find expression either in the work of artists or in writings of dilettanti; but in neither case is the faculty of perceiving the beautiful of much avail unless it be trained and developed by constant study.

How is the public to be educated to enable it to discriminate between artistic products good, bad, and indifferent?

Surely it will seek the architectural profession for guidance and light, but in the present condition of architectural scholarship it will seek in vain. For we are blind leaders of the blind, unable to agree among ourselves as to what is good and bad in our own art, and therefore not in a position to impart sound knowledge to the outside world.

The old-time tradition that an intelligent appreciation of art is born in man and not acquired by education should be at once relegated to the limbo of the past. Natural aptitude or genius can do many things for a man, but, unaided, it cannot make him a great artist.

That the acquisition by the community in general of some knowledge of architecture would make for the advancement of art is undoubtedly true, but the educational process must be evolved from within the architectural profession itself.

APPLIQUÉ WORK IN EMBROIDERY.

EMBROIDERY is not to be thought of as only an affair of the boudoir, a matter of intricacy and delicate work. There are those for whom its chief interest lies in its usefulness in forming part of and sometimes wholly comprising large schemes of decoration. In obtaining the broader effects desirable in a larger composition, without unnecessary expenditure of labour, the *appliqué* method is naturally used in many cases instead of that by which a large surface is covered over with stitches. This is held by purists to be no true embroidery; but this objection is surely obviated if care is taken that the material applied be always of sufficient beauty and richness to warrant its "embroidering" another material. Appliqué work has also this very considerable advantage, that it will harbour less dust and withstand more shaking and brushing than a surface formed of stitches.

Embroidered Banner, by Miss B. A. Waldram.

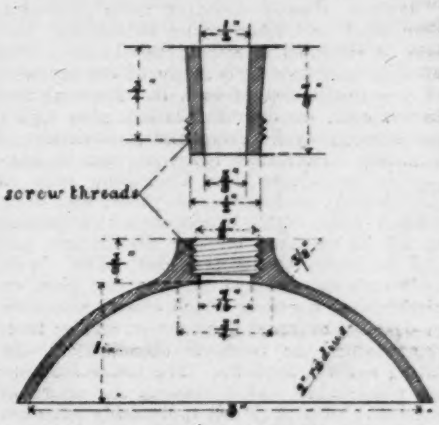
Detail of Embroidered Super Frontal for S. John's, Paddington, by Miss B. A. Waldram.

It is with these considerations in view that Miss Waldram—photographs of two of whose designs we reproduce, and who was for over eight years assistant to Mr. Lewis Day—does her work, reverting to tradition not only for the guidance of the design, but also in an endeavour to use a somewhat neglected treatment, *i.e.*, the inlaying of material and the use of counterchange. In the days when woven fabrics were costly the designer was put to it to save material; hence, we find in the museums a series of hangings in silk, velvet, or other precious fabric in which the ground and pattern are cunningly counterchanged, and the materials inlaid into each other, or two hangings are made, the ground of one being of the same material as the pattern of the other.

It must not be thought that because appliqué work is found more practicable for the broader treatments it permits of coarseness either in working or drawing. Faces treated as those in the banner for St. John's, Red Lion-square, in which the flesh is expressed by a flat piece of tussore silk and the features worked in silk, require far more delicacy and care than faces worked all over, in which a false stitch may be hidden and bad drawing to a certain extent modified by more work. Also, the outline of a leaf, for instance, severely and conventionally treated, must be more rigidly adhered to than that of one which is relieved by shading and blending of colours. And, finally, appliqué work must be in every way well and strongly done, or it fails altogether in its utilitarian purpose.

NOTES ON ASPHALT.

THE large increase during recent years of the use of tar in its various forms for road impregnation has made it necessary to discover some simple means of ascertaining the binding property of this material. Various viscosimeters exist for the purpose of measuring viscosity, which property, in a given tarry mixture, may vary considerably within the ranges of temperature that occur in practice. The case of ordinary asphalt footpaths compounded of common gas-tar and ashes, as contrasted with the more consistent natural asphalt, is an example of this, the former softening much more that the latter with the same accession of heat from the sun's rays. For controlling the consistency of bituminous road-binders E. C. Wallace has suggested a simple form of viscosimeter, which is also equally applicable to the asphalt used in any building operations. As developed by Mr. C. N. Forrest it consists of an aluminium float, or inverted saucer, and a brass collar (see illustration, which shows both parts in vertical section).



The Forrest Viscosimeter.

When operating, the brass collar is placed upon an amalgamated brass plate, then filled with the bitumen or asphalt to be tested, which has been softened by gentle heating, and after cooling somewhat in the collar is placed in ice water at 41° Fahr. for fifteen minutes. When thoroughly congealed, or as near as may be at this temperature, the collar is screwed into the float, and the latter placed on the surface of water heated at 90° Fahr., or any other suitable known temperature. When the bitumen, or asphalt, flows under the influence of heat the float sinks, owing to the ingress of water to the concave side, due to the accession of air through the collar. The time when this occurs, in seconds, is a measure of the consistency of the bitumen. Some of the materials used in the class of work referred to, more especially macadamised road binding, have been tested by this apparatus, and similarly at a series of temperatures with the Engler viscosimeter, with the results tabulated below. This Wallace-Forrest flux meter is known as the N.Y.T.L. apparatus. The results are all recorded in seconds.

The use of this means of measuring flow under heat may be compared with others

Material.	The Flux Meter at 90° F.	Engler Viscosimeter, 100 cubic centimetres' flow at the following temperatures:—		
		77° F.	130° F.	250° F.
Refined water gas tar	20	too stiff	586	50
Crude coal-tar	30	do.	578	50
Tarvia	90	do.	too stiff	62
Tarina	16	1,030	198	34
Texas fluxoil	51	too stiff	198	92
Californian fluxoil	220	do.	too stiff	254
Headley oil No. 2	35	do.	do.	90
Headley oil No. 4	173	do.	do.	98
Headley oil No. 4	416	do.	do.	522
Genasco compound	654	do.	do.	510
Genasco compound	4,195	do.	do.	too stiff
Genasco compound	714	do.	do.	508

previously described and illustrated in the *Builder*, December 31, 1904, page 701.

The adoption of these various expedients for discovering and recording the behaviour of asphaltic substances is due to practical considerations of speed and simplicity, but their existence also testifies to the fact that it is exceedingly difficult to discriminate, by means of chemical analysis alone, between suitable and unsuitable bitumens or mixtures thereof with various lime or siliceous bases. The chemical properties of bitumens are exceedingly complex, and it is with this fact in mind that their study is approached from the side of petroleums (which in the case of the Russian are mainly composed of "naphthenes," and in the case of the American are mainly "paraffins"), and also from that of the less understood coal-substance.

By correlating the various facts thus ascertained it will be possible to arrive at an empirical, if not an exact scientific, guide to the relative value of the numerous natural and artificial bituminous mixtures that are put upon the market in various parts of the world. Two contributions to that end are given below.

Mr. T. H. Pope has rendered into English from the Russian the following account of the investigation of K. W. Charitschkoff into the nature of bitumens as allies of other carbonaceous substances, such as petroleum and the various grades of coal:—

Asphalt always contains more hydrogen than coal or carbonaceous substances, and may be regarded as hydrogenated coal. This view is confirmed by a study of the products of dry distillation of asphalt. Pit coal and brown coal, on dry distillation, give highly unsaturated cyclic compounds, consisting of variously substituted benzenes and of compounds containing less hydrogen, such as naphthalene, anthracene, chrysene, etc. With asphalt more highly hydrogenated compounds would be expected on dry distillation, and this is found to be the case. The liquid hydrocarbons obtained in this way give, on distillation, fractions which closely resemble, in density, external appearance, and in their proportions the fractions obtained on distilling natural naphtha. The lower fractions are remarkably stable towards the action of reagents; thus they are appreciably attacked sulphuric acid, nitric acid, or potassium permanganate, and they do not yield benzene nitro-derivatives when treated with a nitrating mixture. This behaviour, together with the density, points to the predominance of naphthenes in the decomposition products of asphalt. In addition, in the absence of aromatic hydro-carbons, which in naphtha may have a secondary origin, the liquid hydrocarbon fraction of asphalt differs from naphtha in the low density of the distillation residue; this is probably to be explained by the presence in naphtha of more or less asphalt, which raises the density of its residue. The hydrogenated nature of asphalt is confirmed by the character of the distillation products, which are partly hydrogenated aromatic hydro-carbons and partly saturated hydrocarbons. The resemblance, which in some cases amounts to identity, between the decomposition products of naphtha and asphalt indicates an undoubted genetic relationship between the two substances (compare the *Builder*, August 16, 1906, page 230).

At the recent International Congress of Applied Chemistry in London (1909) G. Meaderna made an experimental contribution to the knowledge of bitumens, of which the following is an abstract account:—The bitumens contained in the asphaltums from different parts of Italy have similar properties to those derived from other sources. They dissolve partially in alcohol and in ether, and completely in chloroform. The portion soluble in alcohol is a yellowish viscous mass at the ordinary temperature, possessing the characteristic odour of bituminous substances; that soluble in ether is a black substance, melting at about 60°-70° C.; and the portion insoluble in alcohol and ether is a shining black substance, which is inodorous and melts at a high temperature. All three portions contain unsaturated compounds, the iodine value varying according to the origin of the substance, but being tolerably constant for a particular fraction of a given bitumen. On the other hand, the percentage of sulphur increases sometimes considerably from the less condensed to the more non-condensed portions. The bitumens give the cholesterol reaction. From the results of experiments on the distillation of mineral oils in presence of air, and of sulphur at the ordinary pressure and under increased pressure, the author concludes that bitumens are formed by the action of sulphur on hydro-carbons, leading to the formation of unsaturated compounds. Sulphur may have participated in the formation of bitumens, although not present in the products. The formation of bitumens probably takes place in two stages, viz. (1) condensation or formation of unsaturated compounds; and (2) polymerisation. The action of light on the different fractions of the bitumens is quantitatively different, although qualitatively the same. Under similar conditions the more condensed portions are rendered insoluble to a greater degree than the less condensed fractions.

The Analysis of Calcareous Asphaltum and Paving Mixtures.

Herr Prettner, in the *Chemiker Zeitung* (Vol. 33, 1909), shows that utterly erroneous values may be obtained in the analyses of these substances, for the gypsum present, if that substance (calcium sulphate) be determined in the ash obtained by burning off the organic matter. During the ignition the "organic" sulphur reacts, with any calcium carbonate present, with formation of calcium sulphate and sulphide. A method devised to avoid these errors is set forth, and for the details the technical analyst is referred to the original paper. It comprises (1) The Determination of the Gypsum; (2) The Total Sulphur; (3) The Organic Matter, Soluble and Insoluble in Chloroform being discriminated (compare page 671 of the *Builder*, December 24, 1904).

The lime in the ash should always be converted into calcium sulphate, as variable quantities of the latter are produced during the ignition of the organic matter.

Mr. E. Bornemann, in the *Chemiker Zeitung*, 1909, gives details as to the mode of analysis of asphalt to determine the bitumin-

The following are analyses of various rock asphalts and asphalt-powders, or meals, on the market:—

PERCENTAGE COMPOSITION OF THE BITUMINOUS CONTENTS.

Class of Asphalt.	Origin.	1 Total Bitumen.	2 Bitumen soluble in chloroform by the quick method.	3 Kept by ash.	4 5 Bitumen		6 Bitumen insoluble in chloroform, difference of column 2 and 1.
					4 Soluble in chloroform extraction method.	5 Kept by ash in extraction method.	
Rock asphalt	Sicilian "Bonetti"	11·62	9·405	0·215	9·22	0·00	2·22
Rock asphalt	"Eschershausen," Deutzsche Asphalt Actien Gesellschaft	10·12 10·36	10·12 10·36	0·25 0·13	10·05 10·19	0·16 —	0·00* 0·00
Dalmatian rock asphalt	From Vrgorac Mine	33·15	32·35	0·37	32·92	0·64	0·80
	"Adria"	33·33	32·81	0·22	—	—	0·52
	"Adria"	—	32·43	0·60	—	—	—
	Average of 3 tests	33·24	32·53	—	—	—	0·71
Crushed asphalt	Sicilian, "Cocotesta"	11·25	9·60	0·34	9·66	—	1·65
	Sicilian, Kopp & Co.	10·35	8·87	0·10	8·94	0·30	1·46
Meal	Germany, Deutzsche Asphalt Actien Gesellschaft	12·57 12·47	11·12 10·93	0·27 0·35	11·15 —	0·79 —	1·45 1·54
	Average of 2 tests	12·52	11·025	0·31	—	—	1·495

* The "Deutzsche" rock is free from humus substances insoluble in chloroform.

Mr. Clifford Richardson states, in the *Proceedings* of the American Society for Testing Materials, that Trinidad asphaltum, composed of bitumen in intimate admixture with clayey matter and a thermal water, is extremely uniform in its proximate composition. The usual method of analysis consists in drying at 100° C. for the determination of the water, treating with cold carbon bisulphide for the extraction of the bitumen, and igniting the residue for the estimation of the mineral matter. The total thus obtained, whether on the crude or the refined asphaltum, leaves about 7 per cent. unaccounted for, and this deficit, hitherto often referred to as "organic matter not bitumen," has been found to consist mainly of combined water, alkalis, etc., of the mineral matter. Mr. Richardson shows how the deficit may be properly accounted for by the analyst. The strongly absorptive action of clays, etc., upon bitumen in carbon disulphide solutions was found to be selective; the higher hydrocarbons of the bitumen are absorbed in preference to the lower, the process being similar to that which takes place when crude petroleums are passed through clay for refining purposes.

As regards the physical structure of Trinidad asphaltum, his tests show that the water is held by the clayey matter, the definite ratio of water and clay being due to the capacity of the mineral matter for water; and that the deposit has been formed by the bitumen coming into contact with the original clay-mud of the Trinidad Lake.

Mr. Kenneth G. Mackenzie, of the New York Testing Laboratory, has tested the value of commercial pyridine obtained from Brotherton & Co., Ltd., Sunderland, as a solvent for discriminating various asphalts.

He found the following percentage results, as compared with carbon disulphide as a solvent:—

	Commercial pyridine.	Carbon disulphide.
Bermudez refined asphalt	23	98·6
Trinidad refined asphalt	22	56·0
"J" grade asphalt	27	99·0
Gulf residual pitch	20	97·5

Investigation showed that the commercial pyridine could, with advantage, be separated into a pyridine hydrate, which was almost inactive; into pyridine itself, which was very active; and into picoline, which was more active still. Testing these, the following percentage results were attained, again contrasted with carbon disulphide:—

Material tested.	Pyridine hydrate dissolved.	Pyridine dissolved.	Picoline dissolved.	Carbon disulphide dissolved.
	Per cent.	Per cent.	Per cent.	Per cent.
Bonanza gilsonite	1·7	96·1	99·5	99·7
Bermudez refined asphalt	2·8	94·8	95·6	95·3
Gulf residual pitch	2·1	96·8	97·4	96·8

100 cc. of a constituent of American petroleum, viz., hexane of specific gravity 0·6516. The precipitate designated No. 1 in the subjoined table corresponds to the "asphaltene" of the usual methods (see the *Builder*, p. 670, Vol. LXXXVII.). The precipitates No. 1 were all solid at 105° C. with the exception of those from the coal-tar, which were viscous at the ordinary temperature and fluid at 105° C. Precipitate No. 2 was sticky and soft at 105° C. in the case of gilsonite, and liquid in the other cases at that temperature, whilst precipitate No. 3 resembled machine oil, except that it was more viscous. The precipitate No. 2 is obtained by further treatment with methyl alcohol, whilst No. 3 is the residue therefrom.

Material tested.	Precipitate No. 1.	Precipitate No. 2.	Precipitate No. 3.	Total.
	Per cent.	Per cent.	Per cent.	Per cent.
1. Gilsonite, four samples	47·16	43·07	10·10	99·99
2. "Sarcopetrolene," eight samples	6·85	75·15	19·71	99·92
3. Mixture of Nos. 1 and 2 in equal parts, six samples	28·71	34·38	17·97	100·06
4. Mixture of Nos. 1 and 2, as 1 : 3, seven samples	18·28	64·64	17·22	99·96
5. Light cementing pitch, three samples	18·82	40·29	22·19*	81·22
6. Mixture of Nos. 1, 2 and 5 in equal parts	26·13	48·76	21·50	96·19
7. Trinidad Lake asphaltum cement, five samples	18·43	33·39	22·29	100·1*
8. Pure coal tar pitch, two samples	21·0	—	49·77	—

* Note:—In the material No. 7 the total of 100·1 includes 27 per cent. of the original, insoluble in carbon disulphide.

HISTORICAL BUILDINGS.

REFERRING to the annual Report for the year 1908-9, just issued, on the preservation of historical buildings, etc., the London County Council states:—Since 1891 the Council has secured the insertion in Acts for the construction of underground railways of sections providing that all objects of geological or antiquarian interest discovered in the execution of works in the City of London shall be deposited in the Guildhall Museum, and that any such objects discovered in the county outside the City shall be at the disposal of the Council. In the case of all improvements carried out by the Council steps are taken to secure the preservation of any objects of antiquarian interest discovered in the course of excavation. Buildings acquired by the council with a view to demolition sometimes possess interesting architectural features, in which case steps are taken to preserve the interesting portions, while, if any building is interesting, architecturally or historically, but not sufficiently to warrant the preservation of any portions of it, photographs are taken or drawings made so that a record of the interesting features may be preserved. In this manner a collection of objects illustrative of London history is being formed. Consideration is given also to cases of alteration or demolition by authorities or private persons of buildings in London, the district surveyors having been requested to bring to the notice of the Council such cases as concern buildings of historic or architectural interest. For purposes of record, photographs are taken and drawings made of the buildings and any objects of interest therein. During the year, 284 buillings were surveyed, sixty-four sheets of measured drawings of portions of buildings or objects of interest were prepared, any many photographs were taken. In this connexion particulars were obtained of mediæval walls formerly belonging to the priory of Austin Friars, which were uncovered during the excavations for a block of offices between Austin-square and Great Winchester-street, and fragments of old London Wall which were also uncovered during building operations in America-square and the Old Bailey. The gateway of St. Bartholomew the Great, Smithfield, No. 6, Cheyne-walk, Chelsea, North-end-place (now Pitt House), Hampstead, and several premises in Spital-square and the neighbourhood were the chief buildings surveyed during the year for the purposes of record. During the year H.M. Office of Works furnished the Council with a list of the ancient monuments and historic buildings in England and Scotland in the charge of that department. Reference has been made in previous reports to the steps taken by the Council with a view to the compilation of a register of historic buildings remaining in London. Only one volume of the register has yet been printed, but information for the publication of further volumes is being collected, and at the close of the year the Council was considering as to the steps which might be taken to ensure more regular publication of successive volumes.

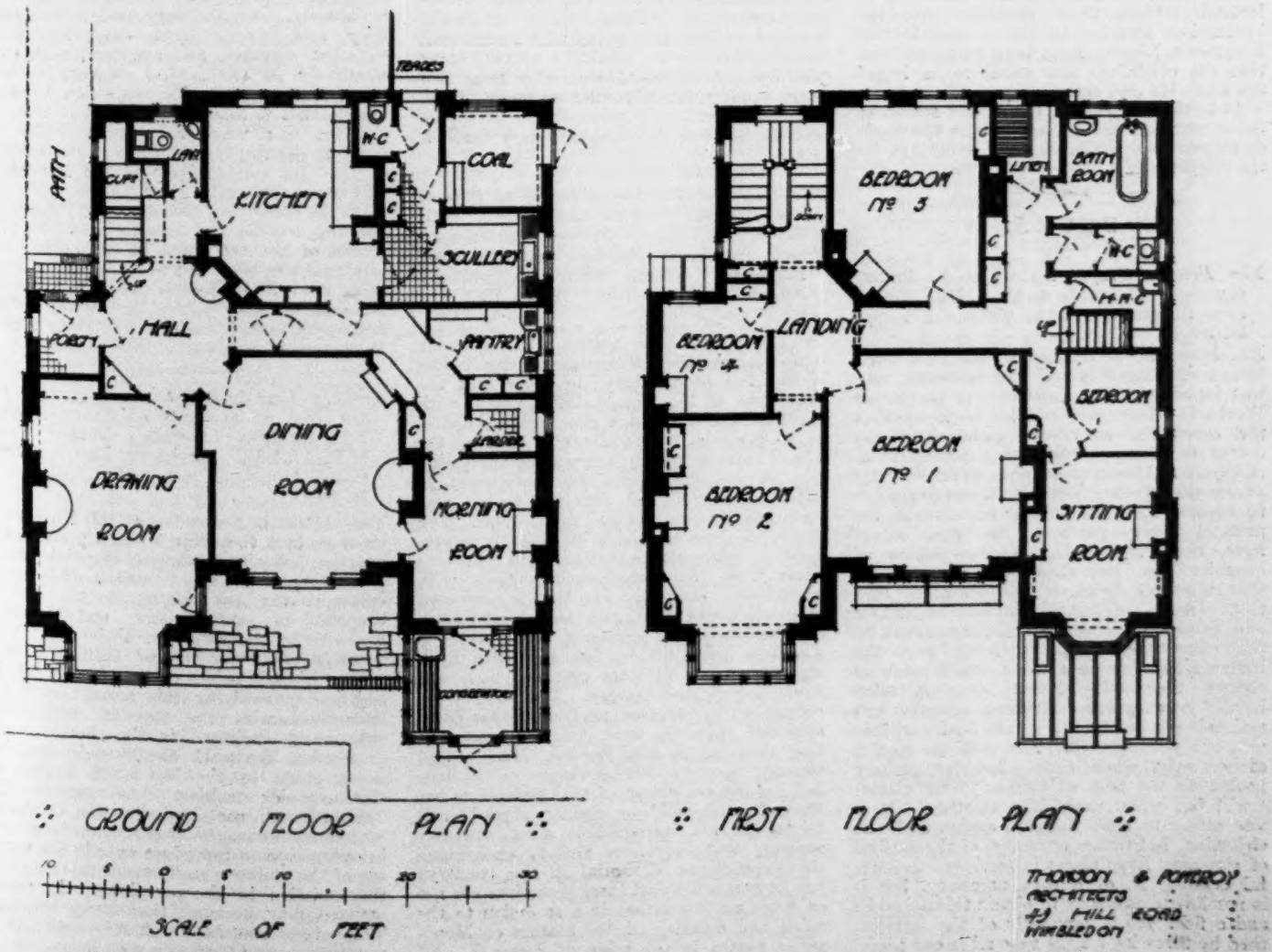
RESIDENCE AT WIMBLEDON.

THIS residence has been built in the Murray-road, adjoining Wimbledon Common.

All the reception-rooms and best bedrooms have a south-west aspect facing the garden, and, owing to the somewhat limited site, it was necessary to place the kitchen-offices facing the road.

The exterior is faced with Petersfield brindled stocks with a few red bricks interspersed, and the roofs are covered with old

RESIDENCE IN THE □ MURRAY ROAD, WIMBLEDON FOR THE MISSES BROWELL.



THOROLD & POWELL
ARCHITECTS
43 HILL ROAD
WIMBLEDON

tiles, giving to the whole a very pleasing and quaint effect.

The contractors were Messrs. James Burges & Sons, of Wimbledon, and the architects Messrs. R. J. Thomson, F.R.I.B.A., and A. G. Pomeroy, M.A., of Wimbledon.

COMPETITION NEWS.

Library Competition, Kingstown, and Sea-Water Baths, Bangor.

The Royal Institute of the Architects of Ireland inform their members that the instructions attached to the competition for Kingstown Library have been amended, and that the conditions now about to be issued are equitable and satisfactory.

As to the competition for Bangor sea-water baths, members are advised to wait the result of negotiations concerning the conditions for the competition.

BOOKS.

The Potter's Craft. By CHAS. F. BINNS. (London: Constable & Co. 1910. Forty-two illustrations and plates. 171 pp. 6s. net.)

MR. BINNS is the Director of the New York School of Clay Working and Ceramics, and was formerly a Superintendent in the Royal Works at Worcester, and his book contains the considered knowledge gathered in the course of a very extensive experience. It is a technical book, although it so successfully avoids the repellent aspect such works are apt to assume. As the author remarks in his preface, twenty years ago the book would have been impossible, as the science of ceramics was not then born. Even now, though science helps, it cannot entirely control. There are certain matters in glazing and firing—capricious volatile ingredients in the glaze and losses in firing and the individuality of one's kiln—which seem as though they will always resist inclusion in the growing army of exact sciences, and maintain personal ability as the final qualification of a potter. "Just as a cook can spoil a dinner even when surrounded by cookery books, so the best of recipes" (for glazes) "will fail when unskilfully treated." It is interesting to note that the author finds no objection, but rather approves, of the method of throwing large pieces in sections. A careful drawing is, of course, necessary, but it is possible in this way to obtain thinner walls and a finer finish, especially of the interior, than by throwing a large vase all in one piece. The Chinese, he avers, have used the method for many hundreds of years. Mr. Binns writes for the guidance of the individual artist engaged in making individual pieces, and such a one should find his book, with its numerous diagrams and illustrations, of interest and utility.

The Principles of Gothic Mouldings. By J. E. GERRARD, M.S.A. (Liverpool: Henry Young & Sons. 1910. 24 pp.)

THIS pamphlet is an attempt to condense into too small a space an exposition of the essential factor in determining Gothic periods and transitions. Those really interested would, we think, have borne with a somewhat fuller account by so capable a writer; those who are not interested will shun these few pages equally with a ponderous tome. It is, however, excellently printed and arranged, and the plate of mouldings, though small, is clear.

The Law and Practice Relating to Patents and Designs (Patents and Designs Acts, 1907-8). By DAVID FULTON, Barrister-at-Law, Associate Member Institute Civil Engineers. Fourth Edition. (London: Jordan & Sons, Ltd. 1910. Pp. 638. 15s.)

IN his preface the author of this work explains that the publication of this fourth edition has been delayed in order that the provisions of the Act of 1907, which, with the Patent Rules and a new Order (LIII.A) as to practice, practically now codifies the law of patents, might receive some interpretation in the courts, and the practitioner in patent law will feel that the author was well advised in taking this course. The result has been to enable Mr. Fulton to produce an authoritative text-book, in which he deals with this complicated subject with remarkable clearness. The text is presented in an attractive form, and the subject matter is exceedingly well arranged, whilst there is a copious index, divided into two parts, dealing respectively with the two sections of the work, patents and designs. The bulk of the volume is not increased, as, trade marks being excluded from the new Act, these are not now included in this treatise. The author strongly approves the provisions of the new Act for the revocation of such patents as are worked exclusively or mainly abroad, and quotes in his introduction some statistics showing that they have already encouraged the expenditure of capital in this country; but he points out that these provisions are not so much an innovation as a reversion to the spirit and meaning of the Statute of Monopolies passed in the reign of James I. All concerned with the law of patents and designs will find this work a valuable addition to their libraries.

Land Taxes and Mineral Right Duties from a Surveyor's and Valuer's Standpoint, with Practical Examples and Sketches. By THOMAS MOFFET, of the Estate and Land Agents' Department, London and North-Western Railway Company. (London: John Murray. 1910. Pp. 141. 5s.)

THE scheme of this work is explained in the introduction: The sections of the Finance Act relating to the four new taxes, increment value duty, reversion duty, undeveloped land duty, and mineral rights duty, have been collected together, and are dealt with consecutively in the several chapters dealing with these taxes. The objection to this system that it renders it difficult to refer to the Act as a whole has been overcome by printing the full text of the material sections of the Act consecutively in the Appendix. The text is unusually clear, and examples are given, in some cases accompanied by sketches, showing how in the author's view the provisions of the Act are to be applied to cases in actual practice. An index would perhaps have been a serviceable addition, but the table of contents enables the subject matter dealt with in each chapter to be easily found. It appears to be a useful little volume

Sanitary Law in Question and Answer for the Use of Students of Public Health. By CHARLES PORTER, M.D., B.Sc., M.R.C.P.Ed., Barrister-at-Law. (Longmans, Green, & Co. 1910. Pp. 150. 2s. 6d.)

THE author, in his preface to this little book, observes that the subject which presents the greatest difficulty to students of public health is sanitary law. The volume is designed to epitomise the law relating to the various branches of sanitary law and to assist students in the forms of their answers to questions that may be set them. As the author himself points out, students must, in addition to studying this treatise, acquaint themselves with the statutes, which are only very condensed in the short answers given; but the work should assist students as a guide to the law which applies to this complex subject. As regards the "definitions" contained in the answers, we venture to suggest that it might be as well in every case to reproduce exactly the wording of the statutes, as, however slight may be the omission in the paraphrase, the words omitted may at some time prove material. The volume contains much information in a small space, and there is a good index.

Heating Engineers' Quantities. The "Simplex" System of Taking out Heating Engineers' Quantities and Measurements. By W. L. WHITE, Assoc.R.San.I., and G. M. WHITE. (London: E. and F. N. Spon, Ltd., 57, Haymarket. 1910.)

THIS work describes a system of taking out engineers' quantities which at first sight seems to belie its name, necessitating, as it does, an elaborate system of marking drawings, and references to those marks on the dimensions. A more thorough examination, however, bears out the authors' claim that the complication is more apparent than real, and, moreover, this system has the advantage of enabling the surveyor to trace any individual item, however small, at any time. We think this work can be studied with advantage by anyone who has to take out quantities for this class of engineering work; at the same time, we are of opinion that, in actual practice, the elaboration might be reduced, while still bearing the vital principles in mind, without detriment to the result.

Staining, Varnishing, and Enamelling. By J. H. GALLOWAY. (London: The Trade Papers Publishing Company, Ltd., Birkbeck Bank-chambers, W.C. New York: The *Painter's Magazine*, William-street. Price 3s.)

THIS little book is No. 8 of "The Decorator" series of practical handbooks, edited by Mr. A. Seymour Jennings, and it explains what the house decorator has to do in order to obtain the best results in staining, varnishing, and enamelling. A point is made in the preface that the author writes from practical experience, and this we can well believe, judging from our perusal of the work, which is well edited and indexed.

The London Citizen's Year-Book for 1910. (London: George Allen & Sons. 2s. net.)

THIS is a well-arranged and useful little work, containing particulars of London's Local Government, its machinery, cost, and problems of local administration and taxation. Special attention is directed by the editor to the section upon the Finance of London Government, and we can endorse the remark that from the information supplied the ratepayer will be able to obtain a good idea of who spends his money and how it is spent. The work includes some portraits and a map of Greater London.

The Borough Technical Institute: Its Origin and Development. By EDRIC BAYLEY, with an Introduction by SIDNEY WEBB. (London: Elliot Stock. 1910. Royal 4to. 85 pp. Plans and illustrations. 6s. net.)

THIS book may be looked upon as a sort of vindication and triumph of its author, Mr. Edric Bayley, who was Chairman of the Governing Board of the Borough Polytechnic Institute from 1891 till 1905, and to whose steady endeavour and sagacious methods the present position of the Institute is to no little extent due. In 1887, in response to a suggestion from the Special Charity Commissioners charged with giving effect to the Parochial Charities Act of 1883, Mr. Bayley convened a meeting, money from private purses was subscribed to meet a corresponding grant from the Commissioners, and the scheme was set on foot. What that beginning led to this book, which is in the nature of a condensed and digested minute book of the progress of the Institute since its inception, sets forth.

The South Devon and Dorset Coast. By SIDNEY HEATH. Illustrated. (London: T. Fisher Unwin. 6s. net.)

THIS work consists of an interesting description of some charming parts of south Devon and Dorset, and it contains much information of a topographical and historical character. The work is one of the County Coast series, and is no doubt intended for the general rather than the architectural reader, and the author can be congratulated upon the production of a suitable work. The architectural descriptions are by no means exhaustive, and this, from our point of view, is the least satisfactory part of the letterpress. The work is illustrated by some excellent photographs, and also by sketches by the author, which, however, are of unequal merit. The volume is a useful addition to the other works of the series.

The Homeland Handbooks, No. 78: St. Ives, Cornwall, with its Surroundings. By ETHEL E. BICKNELL. Illustrated from photographs. (London: The Homeland Association, Ltd., Chandos Chambers, Bedford-street, W.C., and Frederick Warne & Co.)

WE have pleasure in noticing this excellent little work, which is published in co-operation with the Town Council of St. Ives, under the general editorship of Mr. A. H. Anderson, who contributes a short and well-written introduction. The work describes the quaint old town of St. Ives and the neighbouring settlements of Carbis Bay and Lelant, and gives a description of the romantic north coast of Cornwall from St. Ives to Land's End. It also contains an ordnance map, on the 1-in. scale, of the whole peninsula of Penwith. The book is published at 1s. in cloth, or 6d. paper boards. The guide is an admirable work of its kind.

LEGAL COLUMN.

Workmen's Compensation: Arriving at and Leaving Work.

OWING to there being no limit of locality in the Workmen's Compensation Act, 1906, as there was in the Act of 1897 by the use of the words "on, in, or about," there is very great difficulty in determining when a workman commences or leaves the sphere of his employment. It is fairly safe to say that any case which was decided in favour of the workman under the Act of 1897 would apply under the new Act, as the original Act contained the express limitation of locality mentioned above. In our issue of November 2, 1907, we dealt with this question as arising under the new Act, and suggested some general principles which would be a guide in determining where liability towards the workman under the Act would commence and cease. The most difficult class of case is where the workman has to approach or leave his work over premises in the control of his employers but some distance from the spot where he is actually employed. In a recent case, Hoskins *v.* J. Lancaster, the Court of Appeal have again considered this point. A collier, in approaching his work, had to pass through an iron gate at the entrance to his employer's premises 100 yds. from the lamp-room. As he approached this gate was open, but it slammed upon him as he was passing through, and he sustained personal injury. The Court held that he was within the ambit of his employment, as this gate was on the employer's premises and corresponded to a factory-gate, having passed through which, even under the old Act, the workman would be deemed to have been "on, in, or about" the premises. The Court, however, said that it must not be assumed that the protection of the Act extended to workmen on any part of the employer's property. This is the difficult point for determination which has already caused considerable litigation, as the Courts have said a reasonable interval of time and space must be allowed to elapse between the time and place at which the workman is actually engaged. The cases would rather seem to show that in determining this question the intention of the parties to the contract of employment must be regarded. Thus, if a man can only arrive a his place of work by a train which will bring him a little early, and the employers are aware of this, and the man does nothing in the interval outside that it is contemplated he will do, a margin of time will be allowed, and if an accident occurs it may arise out of and in the course of his employment (see Sharp *v.* Johnson, the *Builder*, May 27, 1905). Similarly, if the parties contemplate a workman approaching and leaving the employer's premises by a certain route, and an accident occurs connected with the route, then he may be within his employment, and entitled to compensation. But not so if he is only loafing on the premises for his own convenience, or if he is taking an unauthorised route, or using an authorised route in an improper manner.

Water for Domestic Purposes.

THE case of Metropolitan Water board *v.* London, Brighton, and South Coast Railway, commented upon in the *Builder*, March 26 last, has been carried to the Court of Appeal. It involved the interpretation of certain sections of the Metropolitan Water Board (Charges) Act, 1907, a statute which we have often commented adversely upon, and the Master of the Rolls, in his judgment, characterised the Act as one of the most difficult it had ever been his fate to construe. The question in the case was whether the water supplied at one of the railway company's stations for urinals, lavatories, etc., was supplied "for domestic purposes," in which case the Board, under sect. 8, would be entitled to charge by a percentage on the rateable value of the premise; or whether, under sect. 25, it was supplied for "railway purposes," in which case the railway could, under sect. 16, have a supply by meter. Sect. 25 defines "domestic purposes," and the Master of the Rolls is reported as saying a more confusing and absurd section could scarcely be imagined. In this section "railway purposes" are excepted from "domestic purposes," and as the railways, under the Railway and Canals Act, are bound to afford reasonable facilities for their traffic, including passengers, the Court held the lavatories to be included in the expression "railway purposes." The judgment of the Divisional Court was affirmed, but as the case is at present shortly reported it is not clear whether the Court of Appeal adopted the view expressed by the judges in the Divisional Court that some degree of residence or occupation of the premises is implied where the water is to be deemed supplied for "domestic purposes."

A recent case, South Suburban Gas Company *v.* Metropolitan Water Board (the *Builder*, October, 23, 1909), in which water supplied to premises for lavatories, etc., where 400 men were employed during the day only, was held to be supplied for "domestic purposes" as distinguished from "trade purposes," was much relied upon by the Board, as certain of the lavatories in the case under discussion were used by railway servants, but this case was distinguished, the Court declining to express any opinion as to its correctness, as the expression "railway purposes" involved different considerations.

Overhead Telegraph Wires.

The decision of the Court of the Railway and Canal Commission in the difference which has arisen between the Postmaster-General and the Corporation of Croydon has recently been delivered. The Corporation objected to the erection of overhead telegraph wires in various streets, the grounds of objection being that they tended to depreciate the selling and letting value of house property, that they disfigured the roads, that they made a noise, that they were a source of danger in time of storm, and that they obstructed the traffic. To lay the wires underground involved an additional expense of some 726*l*. The objections as to safety appears to have received some consideration by a condition being imposed as to the use of wire of a larger calibre, and as regards noise, appliances were to be fitted to prevent the humming, but the Court, whilst sympathising with what may be termed the æsthetic objections, declined to impose conditions which would throw an additional burden on the tax-payers in general for the benefit of a particular district, and the scheme was approved subject to a proviso that any lines should be laid underground upon the Corporation undertaking to pay the extra expense. It appeared that some 65,000*l*. had been expended in laying lines underground, whilst the proposed overhead lines represented but an expenditure of 1,800*l*. It would, however, be interesting to know on what principle the districts for overhead wires were selected.

FOREIGN AND COLONIAL.

Building Material, Uruguay.

The *Diario Oficial* of July 16 contains a resolution accepting the estimate of 1,157,900 pesos (about 246,000*l*.) submitted by Señor Leopoldo Peluffo for the construction of the masonry section of the new Parliament building which is to be erected.

THE
BUILDER.
AUGUST 27, 1910.

TO CORRESPONDENTS.

C. S. W. (Next week.)

NOTE.—All communications with respect to literary and artistic matters should be addressed to "THE EDITOR" (and not to any person by name); those relating to advertisements and other exclusively business matters should be addressed to "THE PUBLISHER," and not to the Editor.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

All drawings sent to or left at this office for consideration should bear the owner's name and address on either the face or back of the drawing. Delay and inconvenience may result from inattention to this.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

N.B.—Illustrations of the First Premiated Design in any important architectural competition will always be accepted for publication by the Editor, whether they have been formally asked for or not.

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the prepaid rate of 11s. per annum, with delivery *by Friday Morning's Post* in London and its suburbs.

To Canada, post-free, 11s. 6d. per annum; and to all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, etc., 13s. per annum.

Remittances (payable to J. MORGAN) should be addressed to The Publisher of "THE BUILDER," 4, Catherine-street, W.C.

FIFTY YEARS AGO.

From the *Builder* of August 25, 1860.

M. HITTORFF ON SIR CHARLES BARRY.—The Five Academies at Paris held their annual sitting on Tuesday in last week, and many of the most distinguished celebrities in art, science, and literature, were gathered in the circular theatre of the Palais Mazarin. M. Hittorff, the architect, chose for the subject of his reading a notice on the life and works of the late Sir Charles Barry. English excellence is beginning to be appreciated by French artists at length; and as the individual perseverance of the Anglo-Saxon character is being revealed, a new field of art is opened to their view. The origin of Sir Charles Barry, contrasted with his end and burial, amongst the kings and most illustrious men of his country, was warmly dwelt upon, and elicited great applause.

CORRESPONDENCE.

The Royal Institute of British Architects' Town-Planning Conference.

SIR,—Owing to recent legislation a new era of town planning and reconstruction is about to open in the United Kingdom. That there is no danger of the legal and public health aspects of the question receiving inadequate attention is already clear. But it is equally important, in the interest of our own and future generations alike, that the artistic side of such improvements, with its lasting result in beauty and convenience, be not less fully and authoritatively considered.

With this object the Council of the Royal Institute of British Architects have made arrangements to hold an International Town-Planning Conference, of which His Majesty the King has graciously consented to be Patron, on a comprehensive scale in the second week in October, and we are glad to state that we are already assured of the participation and assistance of many of the most distinguished experts on the subject, not only of our own country, but of Europe and the United States, as well as of others from the overseas Dominions of the Crown.

By an act of disinterested generosity on the part of the President and members of the Royal Academy the Galleries at Burlington House have been placed at the disposal of the Royal Institute for the display of the notable designs and illustrations of town planning and remodelling which have been collected from all parts of the world.

In order that the proceedings of the Conference may be of the widest utility, and that the welcome offered to our numerous foreign guests may be of the most representative character, we desire, by your courtesy, cordially to invite the presence and co-operation of all those who are concerned in order to secure the best results from a movement of not merely local, but national, and even imperial importance.

Forms of membership, with all particulars, may be obtained from the Secretary of the Royal Institute. We are, sir,

JOHN BURNS,
Honorary President of the Conference;
LEONARD STOKES,
President;
ASTON WEBB,
Chairman of the Executive Committee;
JOHN W. SIMPSON,
Secretary-General.

Trafalgar-Square.

SIR,—The article in your last week's issue criticising my design for practically rebuilding Trafalgar-square complains that I have seized on the accident of the death of the late King "to put forward an idea which has more relation to Trafalgar-square than to the event we all deplore," and that I endeavour to excite what you cannot help thinking is a "fictitious interest in the subject," in which you cannot follow me.

It is now a quarter of a century since I first directed public attention to one of the most striking of lost opportunities in London, and since then, at our institutes and in the Press, I have done my best to force this down the throats of a public who require, evidently, some exceptional reason for doing anything in the way of embellishing this fine site.

In my opinion, my design, fully explained in the *Observer* of the 7th inst., may appeal to a nation neglectful sometimes of its heroes; and, if the scheme is carried out, there appears to me no reason whatever why it should not be distinctly identified as a memorial to our late King, and that identification can be well expressed in the square itself.

I think, sir, with great respect, that some more cogent reasons than those you urge should be adduced for throwing cold water on a scheme which would afford fine opportunities for architect, sculptor, and artisan.

WM. WOODWARD.

Losses to Property caused by Lightning, etc.

SIR,—Referring to the paragraph on this subject which appears in last week's *Builder*, there seems to be some misapprehension in regard to the facilities available to the public for insuring against damage caused by lightning and hail. All the fire policies issued by the "Royal" on property in the United Kingdom cover loss which may be caused by lightning, and we believe that this is the case also with most, if not all, of the other fire offices.

Policies can also be readily obtained at moderate rates to cover damage, including hail damage, to glass

H. ATKINSON,
Assistant Secretary, Royal Insurance Co., Ltd., Liverpool.

INTERCOMMUNICATION COLUMN.

Black Varnish.

SIR,—Can you inform me what materials to use, and the proportions to mix with gas-tar, to make the so-called black varnish?

GAS MANUFACTURER.

Foreign Machine-made Plasterers' Laths.

SIR,—As the queries in your issue of August 6 of "One in Doubt" *re* machine-made laths has not been answered, I beg to offer a few remarks. I have been conversant with and seen made for forty-five years hand-rent oak and fir tiling and plastering laths out of the very best English oak and foreign yellow fir, all perfectly sapless. I was superintending the erection of a very large residence a few years ago, and, of course, recommended rent fir plastering laths. I had, however, to use the foreign sawn spruce laths. Now, in fairness, I must say we made a first-class job of the plastering, the laths not bulging in the least. There is probably a little less plastering used with sawn laths, but I have not the least hesitation in saying that there is no comparison as to the durability of the two sorts of laths, the rent laths from the foreign yellow fir being, in my opinion, 50 to 60 per cent. better.

CLERK OF WORKS.

Building Line Restrictions.

[We notice that our correspondent "Quien Sabe" has received no answer to a query he inserted in the "Intercommunication Column" under the above heading in our issue August 6. He inquires whether, where a building scheme is in existence relating to a particular building estate under which the land has been sold subject to certain restrictions, including a covenant as to building line, the local authority, when plans are submitted to them for approval, are bound to inquire whether there is a building line restriction, and can compel it to be observed either at such time or when the existence of the covenant is brought to their notice. We do not profess to give legal advice through our columns, but the answer to these questions seems to depend upon general considerations. We apprehend that the restrictive covenants attaching to a particular building estate would not affect the powers or discretion of the authorities in any way except in so far as the erection of a certain number of buildings in accordance with the prescribed line might create a general line of buildings, which would be taken into consideration when a building line came to be fixed. Purchasers of land held subject to building schemes can enforce the covenants as against the vendor, and also in certain circumstances as against other purchasers. The conditions which must exist to give the purchasers such rights were considered in the case of Elliston *v.* Reacher, and will be found summarised the *Builder*, September 12, 1908.]

ILLUSTRATIONS.

Roof and Screens, Church of St. Peter, Shorwell, I.W.

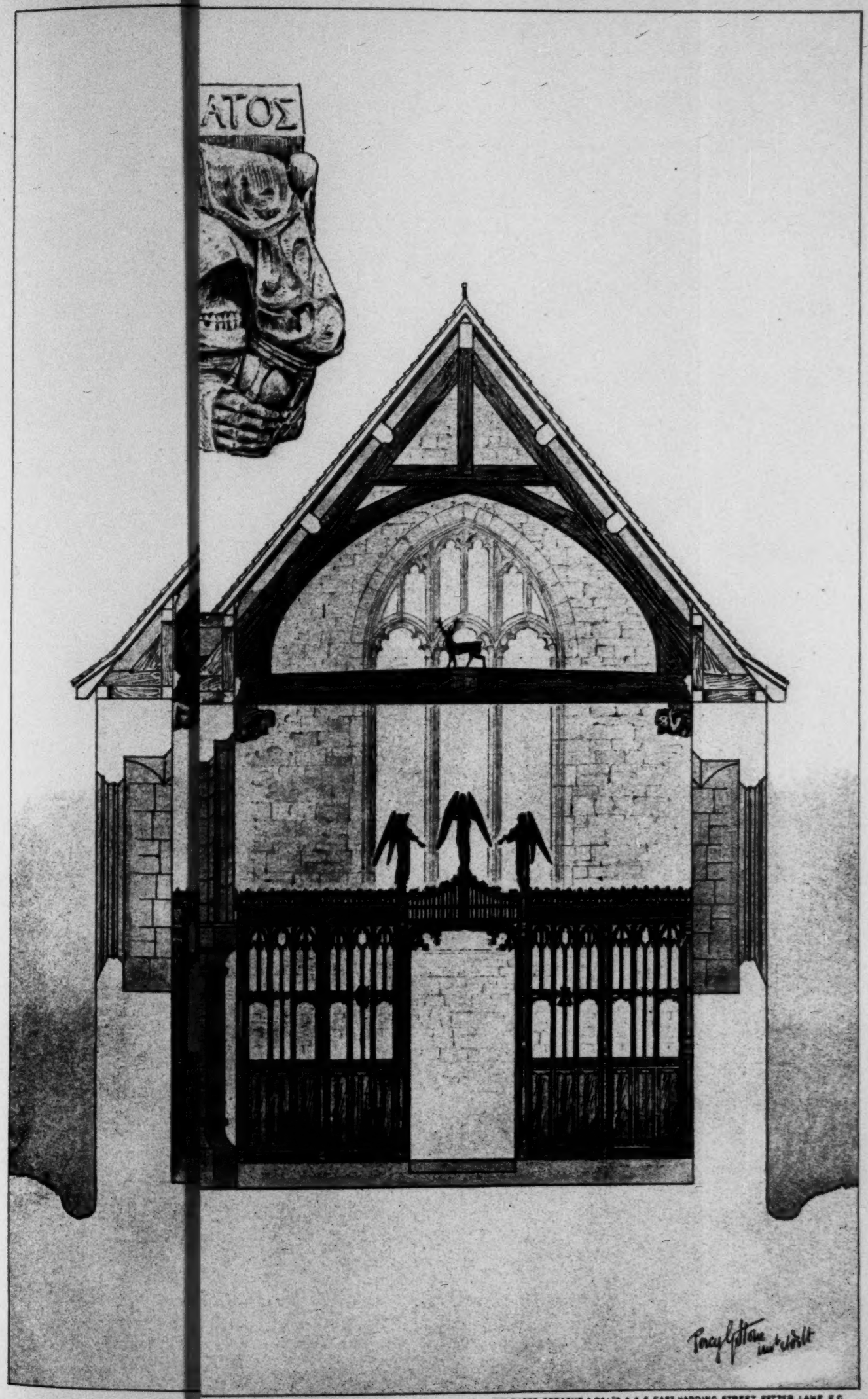
THIS is an illustration of the new roof which was put on Shorwell Church some years ago, when the rood beam with figures carved by Messrs. T. & E. Nicholls, of Wincott-street, was placed in the church. The side corbels of "Sin" and "Death" supporting the rood beam are carved in Irish limestone, also by Messrs. T. & E. Nicholls. All the rest is English oak. Messrs. T. & E. W. Jenkins, of Newport, I.W., were the contractors, and Mr. Percy G. Stone, F.R.I.B.A., of Newport, I.W., was the architect.

Sketches with the Architectural Association Excursion.

WE give this week additional sketches, by Mr. C. Wontner Smith, made in connexion with the Architectural Association Excursion in Yorkshire. Our report of the excursion, giving some notes of the buildings visited, will be found in our last issue (when we devoted the whole of our inset illustrations to buildings visited by the party) and in the *Builder* for August 13, page 181.

Chinese Paintings.

THESE illustrations are given in connexion with our leading article this week, where other illustrations from the same collection will be found. We think it will be agreed that these paintings have an exceptional interest for their decorative quality.



INK-PHOTO. SPRAGUE & Co LTD 4 & 5. EAST HARDING STREET, FETTER LANE, E.C.

Church of St Peter. Sho

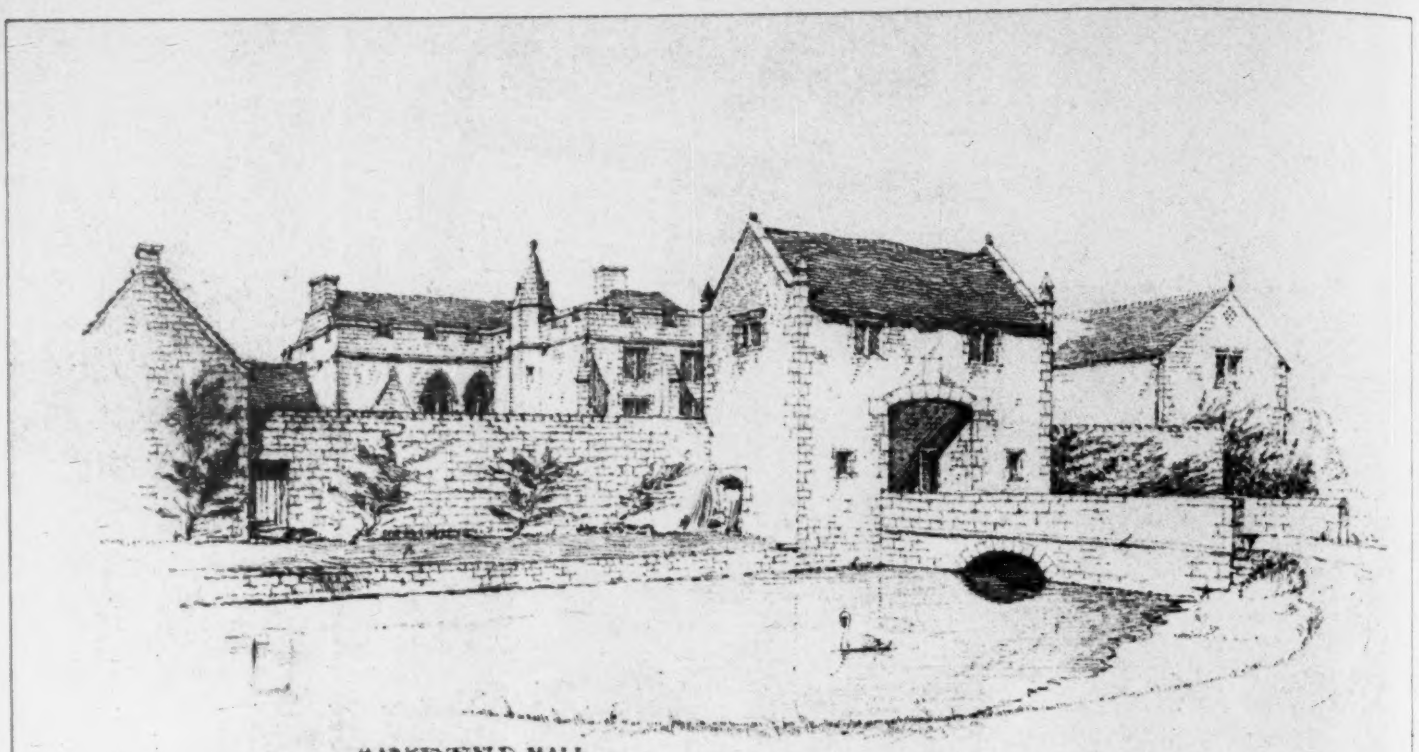
New roof and Chancel Sc

ter. Shorwell I.W.

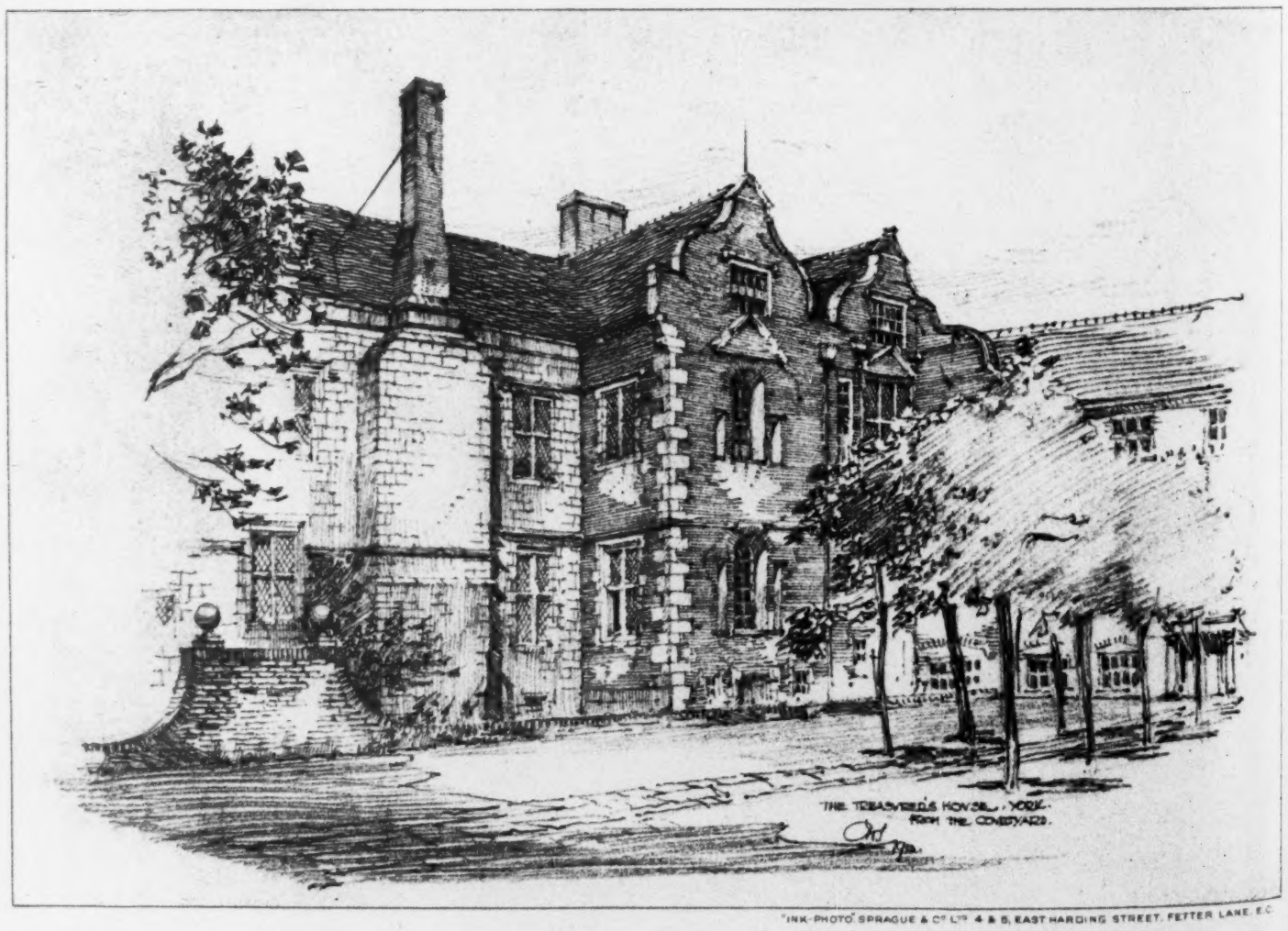
Chancel Screens.

Percy Stone and Webb

INK-PHOTO. SPRAGUE & Co LTD 4 & 5. EAST HARDING STREET, FETTER LANE, E.C.



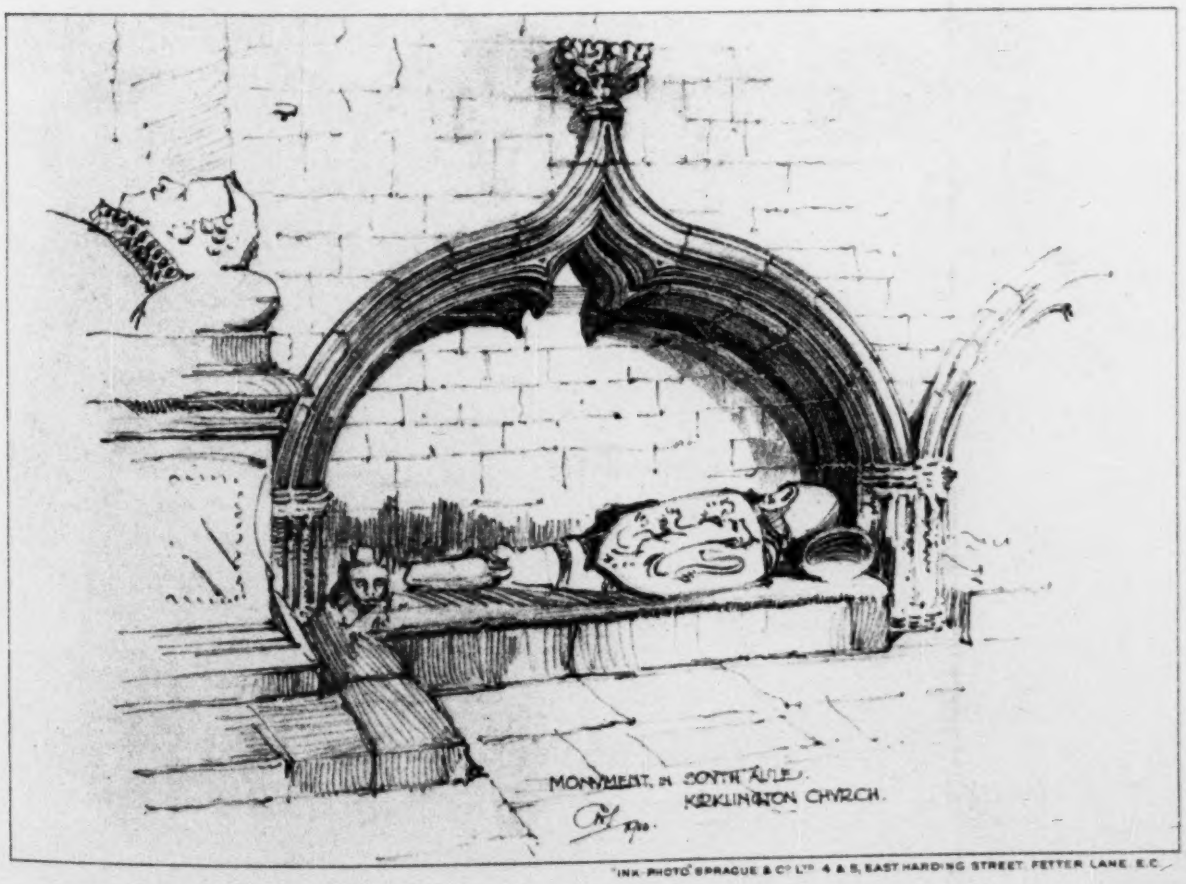
MARKENFIELD HALL.



"INK-PHOTO" SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

SKETCHES WITH THE ARCHITECTURAL ASSOCIATION EXCURSION.

MARMION. TOWER. WEST TANFIELD.



MONYMENT IN SOUTH AISLE.
KIRKLINGTON CHURCH.

"INK PHOTO" SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

SKETCHES WITH THE ARCHITECTURAL ASSOCIATION EXCURSION

Sprague & Co., Ltd., Printers, 4 & 5 East Harding St., E.C.

CHINESE PAINTINGS:

No. 39—KWANYIN, THE GODDESS OF MERCY. YÜAN DYNASTY.

Sprague & Co., Ltd., Printers, 4 & 5 East Harding St., E.C.

CHINESE PAINTINGS:

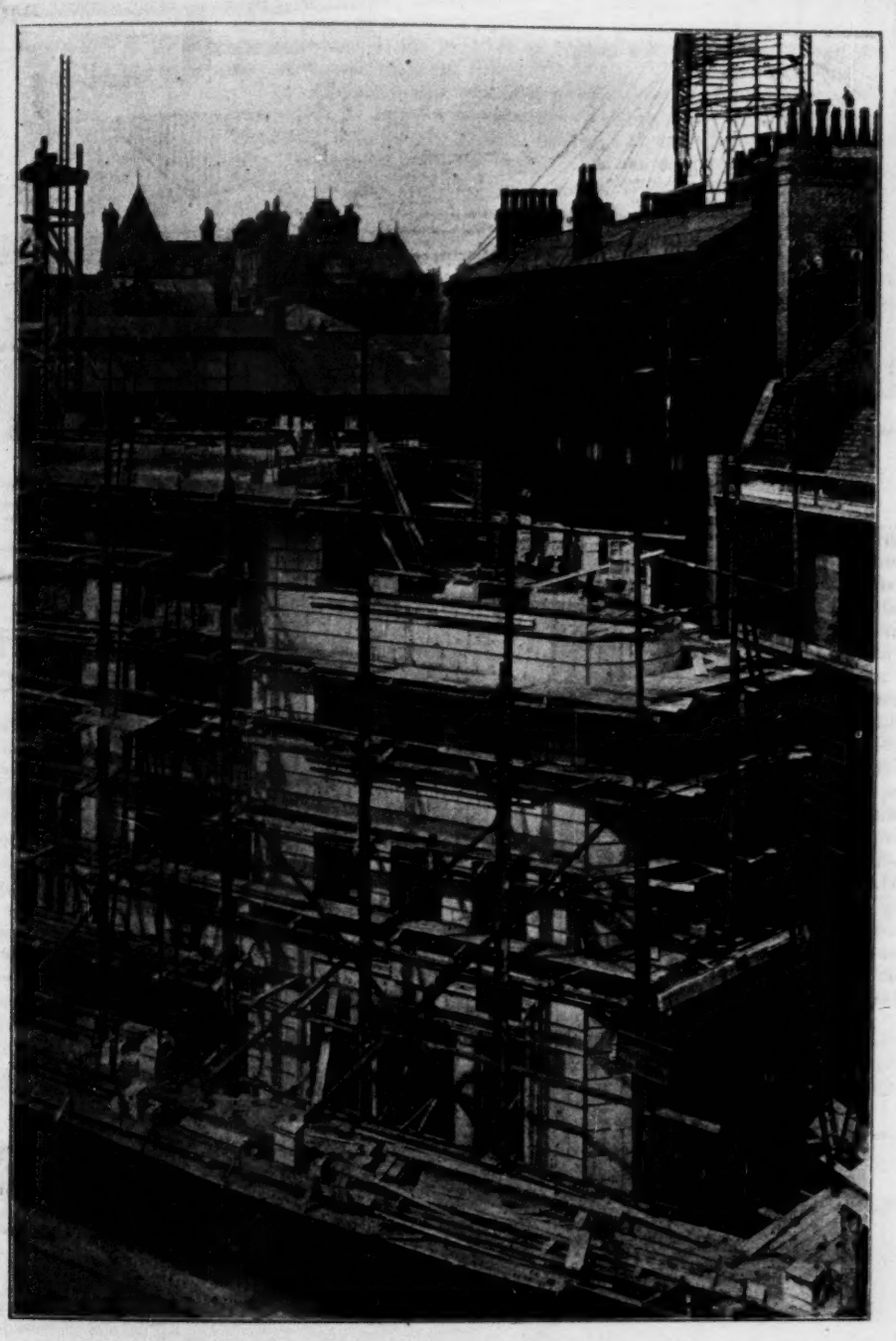
No. 61.—TIGER. MING DYNASTY.

M

REI

UNTI
ar
fo
m
that mater
a skeleton
brick, or te
is well illus
in the pr
concrete
accordance
Situated
with a fro
street, Lee
ground flo
Hall Taver
pation as
The bas
forced con
intervals h

MONTHLY REVIEW *of* ENGINEERING.



Offices, Infirmary-street, Leeds.

REINFORCED CONCRETE AND TERRA-COTTA OFFICE BUILDING.

UNTIL an appropriate and pleasing architectural style has been evolved for reinforced concrete buildings the most suitable method of applying that material is to employ it in the form of a skeleton afterwards clothed by stone, brick, or terra-cotta. This mode of treatment is well illustrated by the building described in the present article. The reinforced concrete construction throughout is in accordance with the Coignet system.

Situated on a triangular plot of land, with a frontage of 106 ft. on Infirmary-street, Leeds, it comprises six stories, the ground floor being destined for the Cloth Hall Tavern, and the upper floors for occupation as offices.

The basement is surrounded by a reinforced concrete retaining wall pierced at intervals by openings for pavement lights, and sheathed externally by 9-in. brickwork. Fig. 1 is a typical section of the retaining wall in which the reinforced concrete is 4 in. thick, having vertical rods of $\frac{3}{4}$ in. diameter, spaced 4 in. apart, and horizontal rods of $\frac{1}{4}$ in. diameter spaced 12 in. apart. The vertical rods are continued down to the footing and, after being bent around a $\frac{1}{2}$-in. diameter horizontal rod, are extended along the lower part of the footing, which, together with the brick wall, is carried on a block of plain concrete 3 ft. wide by 12 in. deep. The top of the reinforced concrete retaining wall is finished by a beam 8 in. wide by 13 in. deep, having both compression and tension bars securely connected by vertical ties designed for resistance to shear and diagonal tension. In this beam are anchored some of the bars reinforcing the floor slab at ground floor level, as represented in the section.

Fig. 2 is a section through one of the pavement light openings at a part where the construction is somewhat different from that already described. An interesting detail in this drawing is the very narrow and deep beam buried in the thickness of the outer wall.

The skeleton of the superstructure comprises reinforced concrete wall and interior columns transmitting to the soil all loads from floor and roof beams and wall lintels. The floors and flat roofs are of reinforced concrete throughout, and the walls are supported at each story by reinforced concrete lintels.

Fig. 3 is a sectional plan over the circular entrance to the building and shows the general design of square and circular columns as well as details of the lintel and floor construction. Fig. 4 is a section showing the reinforcement

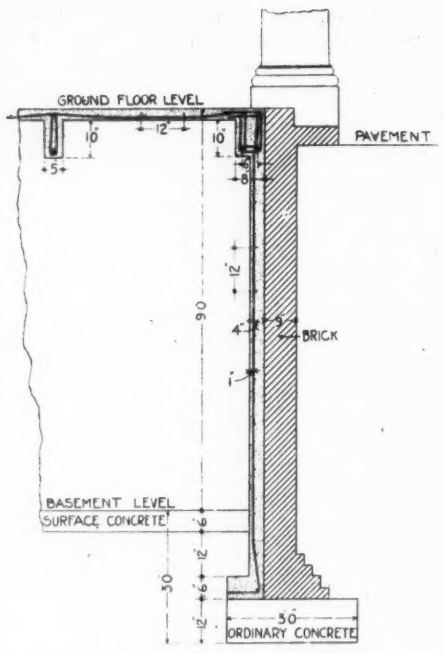


Fig. 1. Retaining Wall. Typical Section.

more clearly in one of the ground floor lintels and the special arrangement of bars in the beams. It will be noticed that the main tension bars are bent up at different points and hooked over the compression bars. The effects of this arrangement are to provide an ample proportion of steel at the middle of the beam where the bending moment is greatest, to make adequate connexion between the tension and compression areas, and to afford due reinforcement against secondary stresses resulting from the combination of shear and bending moment.

The outer walls constitute an interesting feature of this building, being composed of an outer shell of terra-cotta maintained in position by concrete filling carried by the reinforced concrete skeleton. The nature of the arrangement is shown in section by Fig. 5, while the general effect may be seen in the view reproduced from a photograph taken during construction. The interior partition walls are of reinforced concrete, but brick was used in some cases, and a fire-resisting staircase in reinforced concrete has been included.

The building was designed by Mr. Sidney D. Kitson, F.R.I.B.A., of Leeds, the contractors being Messrs. Henry Atkinson & Sons, licensees under the Coignet system of armoured concrete.

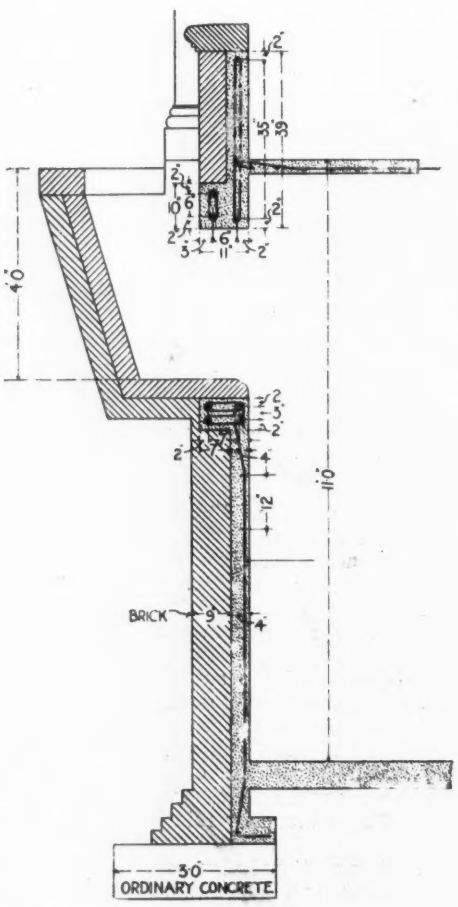


Fig. 2. Retaining Wall to Pavement Lights.

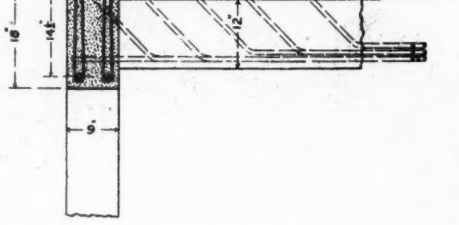


Fig. 4. Wall Lintel and Beam.

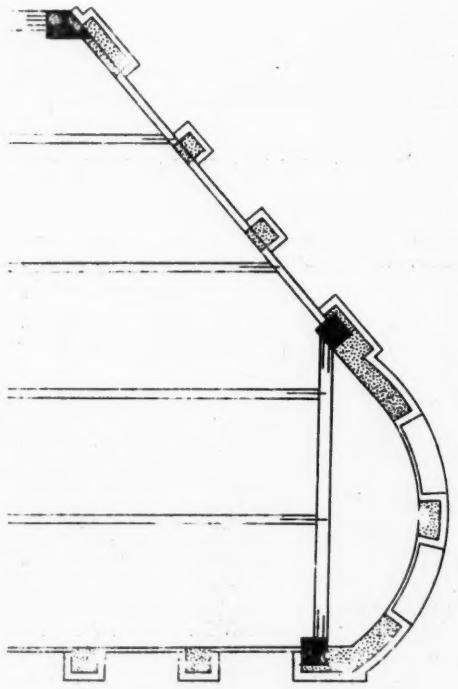


Fig. 5. Plan showing Terra-Cotta Facing and Concrete Backing.

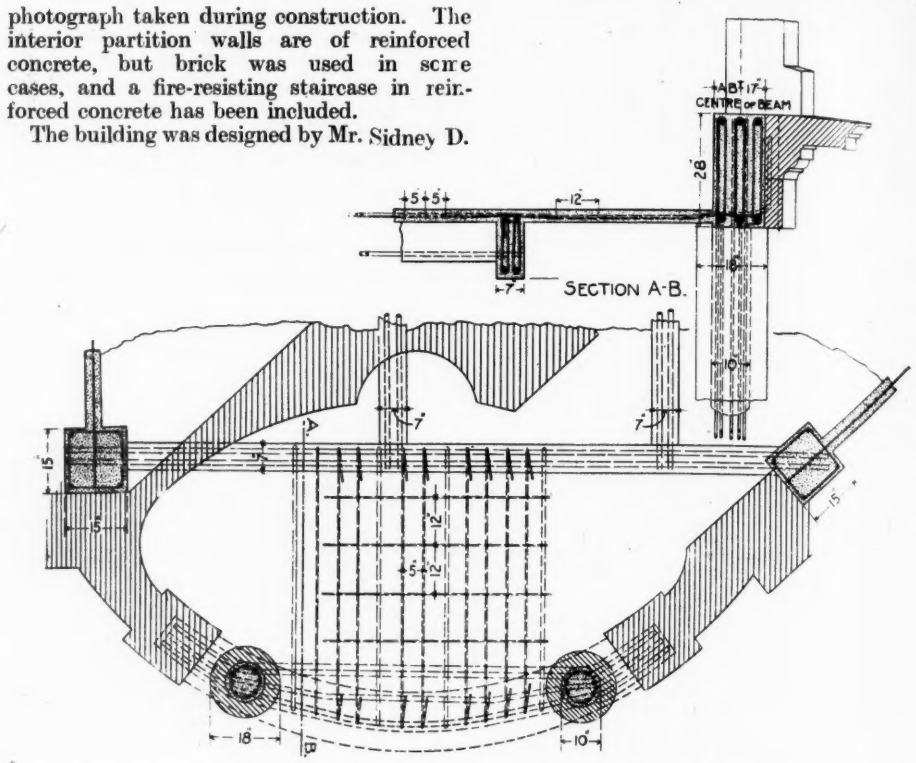


Fig. 3. Column and Beam Construction at Rounded Corner.

A HIGH RETAINING WALL IN REINFORCED CONCRETE.

In order to provide for the requirements of the Corporation Depôt at Smethwick a lofty retaining wall of unique design has recently been constructed along the towpath of the Birmingham Canal.

The surface of the ground in the depôt is 25 ft. above the level of the towpath, a condition necessitating the construction of a retaining wall with the total height from foundations to coping of 34 ft., or 40 ft. including the parapet.

In addition to earth pressure the wall has to withstand the loads due to steam rollers and other heavy traffic. Therefore it was essential to build the wall of exceptional strength and with great resistance to overturning moments. The adoption of ordinary

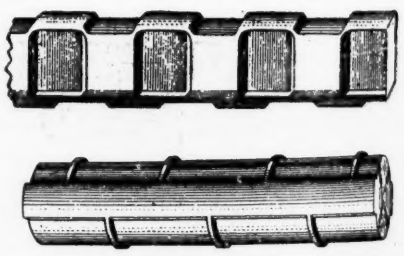


Fig. 3. Forms of Indented Bar Used.

concrete would have involved such massive proportions as to bring up the weight to more than 13 tons per foot run, thus imposing excessive pressure on the foundations, with the probability of serious troubles in consequence of unequal settlement, to say nothing of risk to the adjoining canal.

By the adoption of reinforced concrete the weight of the construction has been reduced to barely one-fifth of that required by ordinary concrete, thereby giving an assurance of permanent stability and effecting a very considerable saving in first cost.

Fig. 1 is a typical section of the wall, which consists of a vertical slab ranging in thickness from 7 in. at the bottom to 4 in. at the top, and rising from a footing 5 ft. wide by 16 in. deep. The slab is stiffened at intervals of 8 ft. by triangular counterforts about 12 ft. wide at the bottom, their thickness ranging from 10 in. to 6 in. The counterforts are connected with the footing beneath the

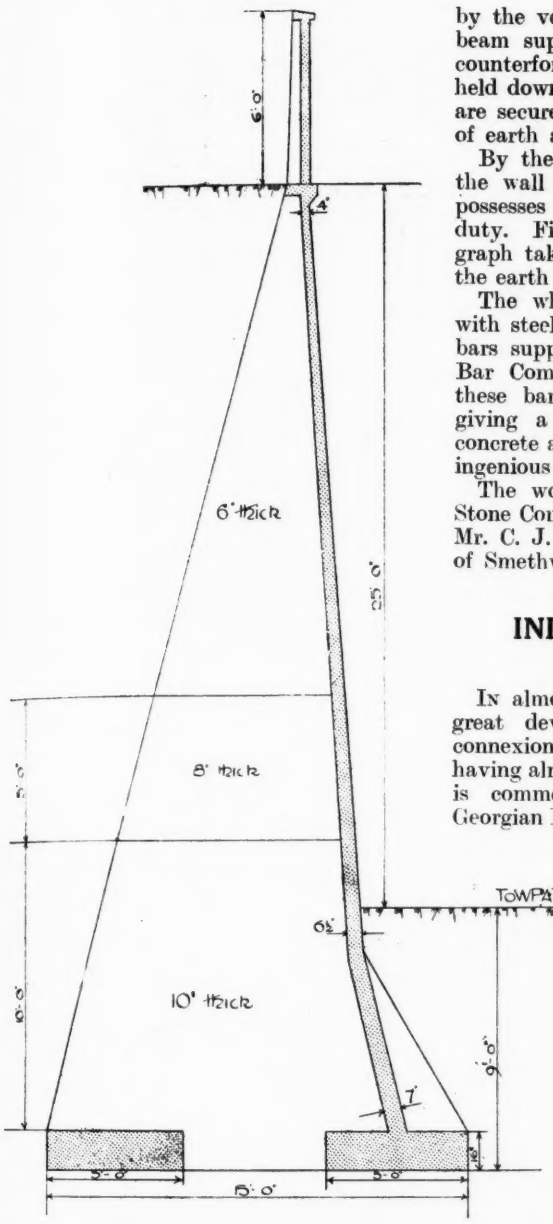


Fig 1. Retaining Wall.

wall slab and also with a second continuous footing of equal dimensions as shown in the section.

The horizontal thrust of the earth is taken by the vertical slab acting as a continuous beam supported at short intervals by the counterforts, these members in turn being held down by the horizontal footings, which are securely kept in position by the weight of earth above.

By the adoption of this type of design the wall is proportionately light and yet possesses ample strength for its intended duty. Fig. 2 is reproduced from a photograph taken at the back of the wall before the earth was filled in.

The whole of the concrete is reinforced with steel in the form of square indented bars supplied by the Patent Indented Steel Bar Company, Ltd., the special feature of these bars being a series of indentations giving a mechanical bond between the concrete and the steel. Two varieties of this ingenious bar are illustrated in Fig. 3.

The work was executed by the Empire Stone Company, Ltd., under the direction of Mr. C. J. Fox Allin, the Borough Engineer of Smethwick.

INLAND NAVIGATION ABROAD.

In almost every country except our own great developments are taking place in connexion with inland navigation. Canada, having already an extensive system of canals, is commencing the construction of the Georgian Bay Canal at the cost of 20 millions, so as to open the great lakes to ocean steamers. The United States contemplate the expenditure of some 100 millions upon additional waterways in the Mississippi Valley, to say nothing of the Panama Canal. France is continuing the policy which has provided one of the finest systems of inland waterways in the world at a cost of about 120 millions during the past forty years. Belgium and Holland have been equally active, and some remarkable works have been undertaken in Germany and Austria within recent years.

The five principal rivers of Germany are now being converted into a connected system of waterways serving the entire country. The Rhine-Ems Canal, in conjunction with the improvement of the River Ems, affords a direct outlet for the Rhine into the North Sea at Dortmund, where harbour works equal to those of Hamburg are under construction. By the completion of the Ems-Rhine-Main route now in progress Germany will obtain a great inland waterway passing through populous industrial districts and extending from the North Sea to Switzerland, with connexions through Austria to the Black Sea.

The Weser, with its great port of Bremen, is navigable as far as Münden, and its tributary, the Fulda, has been canalised up to Cassel, while the main river, already joined by a canal with the Ems-Rhine route, will be connected in the near future with the three more easterly trunk routes.

The Elbe, having Hamburg 75 miles from the mouth, is also in communication with the Baltic by the Trave and connects with the Danube above Dresden. Within the borders of Austria this river is to be canalised so as to afford ready access to Saxony, the Rhine Valley, and the North Sea, and a canal has been authorised from the Elbe to Kiel.

More to the east the Oder is to be canalised at the cost of 1,000,000*l.*, from a point south of Frankfurt to Oderburg on the Austrian frontier, whence starts the new Danube-Oder Canal, a work which will link up the Oder, the Danube, the Elbe, the Vistula, and the Dnieper, at an estimated cost of 34,400,000*l.* The Oder, already connected with the Havel and the Spree by the Friedrich Wilhelm Canal, is the starting point of the Berlin-Stettin Canal, estimated to cost over two millions, and destined to convert Berlin into a first-class inland port.

The Vistula, passing from Austria to the Baltic, will be linked up on the west with the Oder and the Danube, and on the east with

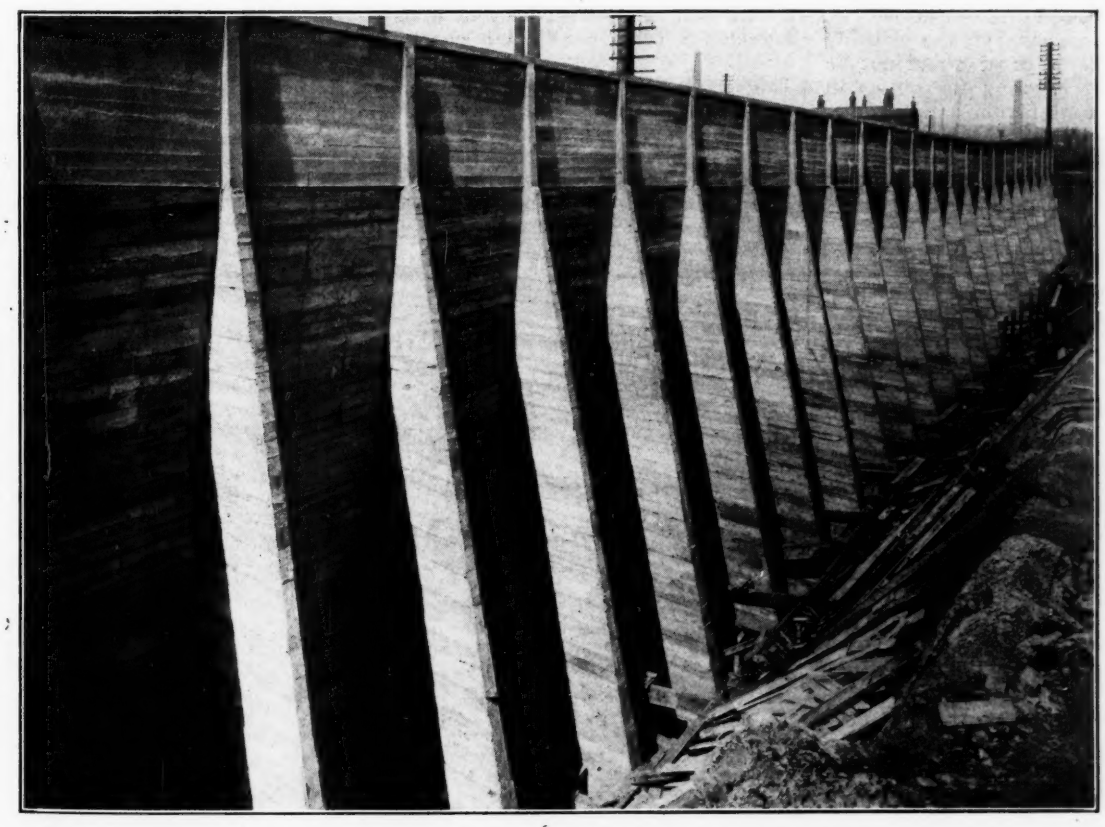


Fig 2. View of Back of Retaining Wall in Reinforced Concrete.

the Dnieper, thus obtaining direct access to the Black Sea and Odessa.

The cost of the great undertakings here briefly sketched will not be less than 70 millions, and, although many of the canals cannot be looked upon as remunerative investments for capital, the advantages they will confer upon the countries affected cannot be over-estimated. The connected system of natural and artificial waterways penetrating the German and Austrian empires from the northern and southern seas to their most inland districts will in course of time be linked up with the waterways of France, Belgium, Holland, Switzerland, and Russia, and it is scarcely possible to exaggerate the importance of the commercial developments which will be fostered between the countries so placed in communication.

The insular position of Great Britain happily provides a natural waterway untrammelled by banks or other limitations, and extending to every part of the globe. That in itself is a great advantage, but there is no reason why it should cause us to overlook the benefits to be secured by an adequate system of inland navigation whereby important commercial and industrial centres may be placed in direct communication with the sea. It would be difficult to make any reliable forecast as to the date or period when active steps will be taken with this object. The Royal Commission on Canals and Waterways have already recommended the appointment of a Central Waterways Board for the purpose of formulating schemes of improvement and particularly to carry out a project for connecting the midland counties with the Thames, the Humber, the Mersey, and the Severn. At present the report of the Commission is safely pigeonholed, and will probably be forgotten unless those interested in the subject bring pressure to bear upon the Government.

FORTH AND CLYDE SHIP CANAL.

EFFORTS are being made by the Mid-Scotland Ship Canal Association to interest the public in the project for the construction of a canal wide and deep enough to permit vessels of the largest size to pass directly between the Atlantic and the North Sea through Loch Lomond and the valley of the Forth.

In the opinion of Messrs. D. A. and C. A. Stevenson, who were consulted on the subject in 1889, the enlargement of the existing Forth and Clyde barge canal would not be a desirable way of effecting the object in view. These engineers favour a new route, leaving the Forth just above Grangemouth, passing to the south of Stirling, and following the Forth Valley and the Endrich to Loch Lomond. Arrived there, the route is across the lake to Tarbet, by a cutting into Loch Long, and thence into the estuary of the Clyde.

The line selected involves no striking obstacles, and avoids such disadvantages as attend the diversion of rivers and interference with existing lines of communication. The Forth Valley is nowhere more than 50 ft. above sea level, but before entering it a cutting 191 ft. deep would be made near Stirling. The next deep cutting is that through an outlying spur of Ben Lomond, rising to the height of about 260 ft. Fortunately this cutting would be very short. For 13 miles through Loch Lomond no engineering work is necessary, as the depth of water is adequate for the largest ships afloat. The cutting from Tarbet to Loch Long would be $1\frac{3}{4}$ miles long through somewhat rough country, and the remainder of the distance is represented by the waters of Loch Long. The project contemplates three sets of locks, one at Grangemouth, one at Arrochar on Loch Long, and a regulating lock at the head of the Endrich Valley.

The total estimated cost is put at 24 millions, towards which the Government have offered State aid providing due compliance is given to the requirements of the Admiralty.

The commercial value of the proposed canal is so great that we have no hesitation in saying that if this country belonged to Holland or Belgium the work would be put in hand at once by the State, while its strategical advantage is so obvious that if the Germans were in our place we may be sure that the communication would to-day be an accomplished fact.

WATER PURIFICATION BY OZONE.

EXPERIENCE in Paris, Wiesbaden, Paderborn, and elsewhere on the Continent demonstrates the efficiency of ozone for the sterilisation of water, but it must not be supposed that the process is one to be adopted except under the very best expert advice. This view is abundantly supported by the startling report issued by the Ontario Provincial Board of Health relative to the operation of the ozone plant at Lindsay during the three months ending January last.

The raw water is obtained from the Senrog River, and, in addition to containing large numbers of colon bacilli, it is characterised by high colour and unpleasant flavour. The purification plant consists of two mechanical filters and apparatus for the generation and application of ozone.

From the report of investigations made by Dr. G. G. Nasmith and Dr. G. R. Philp it appears that while ample quantities of ozone were produced there was practically no mingling of the gas with the water owing to the inefficient nature of the distribution appliances. The general result is that the "ozone has done absolutely nothing, not even removing the colour in the slightest degree," Dr. Nasmith adding the comment that the "system as installed at Lindsay is an absolute failure."

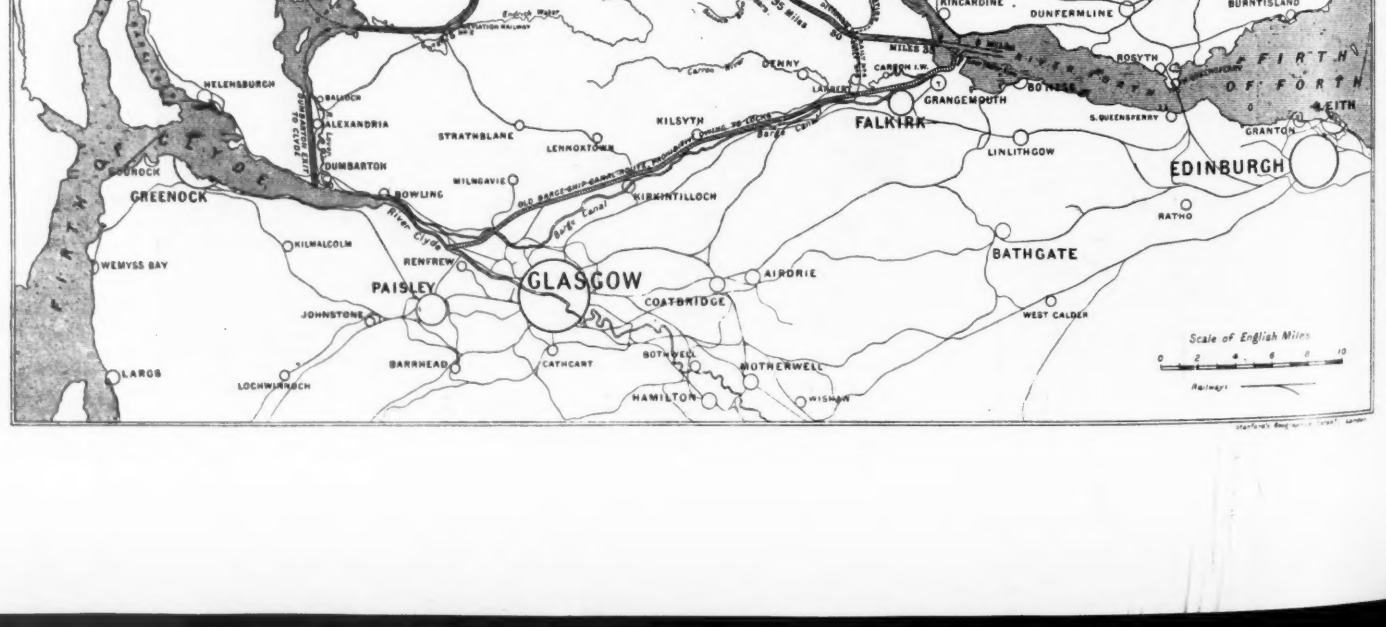
The moral is that this method of water purification is one not to be lightly undertaken, and when adopted not to be entrusted to the management of inexperienced persons.

Metallic Filament Lamps and Electric Lighting. ACCORDING to Mr. S. E. Fedden, the manager of the Sheffield Corporation electric light department, the reason for the deficit of 2,035*l.* on last year's working is mainly due to the great increase in the use of metallic filament lamps, but he thinks that although the receipts will continue for some time to fall, the new connexions for the year, which are 299, as against 217 for the previous year, tend to show that the department is already beginning to benefit by the reduced cost of electric lighting.

Utilisation of Destructor Clinker. AT the new refuse destructor station constructed for the Corporation of Coventry a light tramway track and steel side-tipping trucks are provided throughout the furnace building, and out into the yard, for the removal of the furnace residue, and a clinker crusher and rotary screen with suitable hoppers are installed for crushing and grading the material. The remaining clinker will be utilised for paving works. Part of the crushed material will be mixed with Portland cement, and more finely ground in a special mill, and pressed into paving slabs for use on the city footpaths. The slab-making plant comprises a 500-ton hydraulic press fitted with a special vacuum attachment for lifting the slabs from the moulds to the carrying-off hoppers, which serve, by means of a traverser, three tracks of rails arranged for storage purposes. The plant is capable of producing 100 sq. yds. of $2\frac{1}{2}$-in. thick flags in a ten hours' working day.

Electric Motor Working under Water. A MISHAP illustrating the utility of electric power was afforded in January last at a mine in Massachusetts, when owing to sudden thaw an electrically-driven pump was completely submerged by an influx of surface water. As there were imperative reasons for not stopping the pump it was allowed to run, and continued in operation until it had cleared away most of the water. After having been cleaned and oiled the motor was started again, and, according to the *Engineering Record*, has been at work for twenty hours a day ever since without giving any indication of having suffered injury.

FORTH AND CLYDE BATTLE-SHIP AND OCEAN-GOING STEAMER CANAL.



Dust in Schools. A REPORT by Dr. Sowden, Medical Officer of Health for East Ham, states that the dust in schools consists of: (1) Inorganic or mineral matter derived from the roads outside, brought in on children's boots, and from the wear of materials inside. (2) Organic dust derived from the children's bodies, and including bacteria. This dust is decomposable, and so becomes foul if not removed; it may also contain germs of disease. The close, stuffy odour, so obvious in a classroom, especially if the windows are closed, is due to this organic dust. Hence the more free the school from dust the healthier it is. For this reason it is important to limit the number of maps, pictures, and paper hanging on the walls, and to see that the furniture and fittings are as far as possible so designed as not to harbour dust.

Moving Pakefield Lighthouse. A BRITISH example of building removal—although on a small scale—is furnished by the recent case of Pakefield Lighthouse, in Suffolk, which has been shifted about 300 ft. back from the shore owing to continued erosion. The building consists of iron framing and exterior covering with brick interior walls and plaster ceilings, the total weight being nearly 70 tons. It was moved upon a cradle built for dealing in a similar way with Lowestoft Low Light.

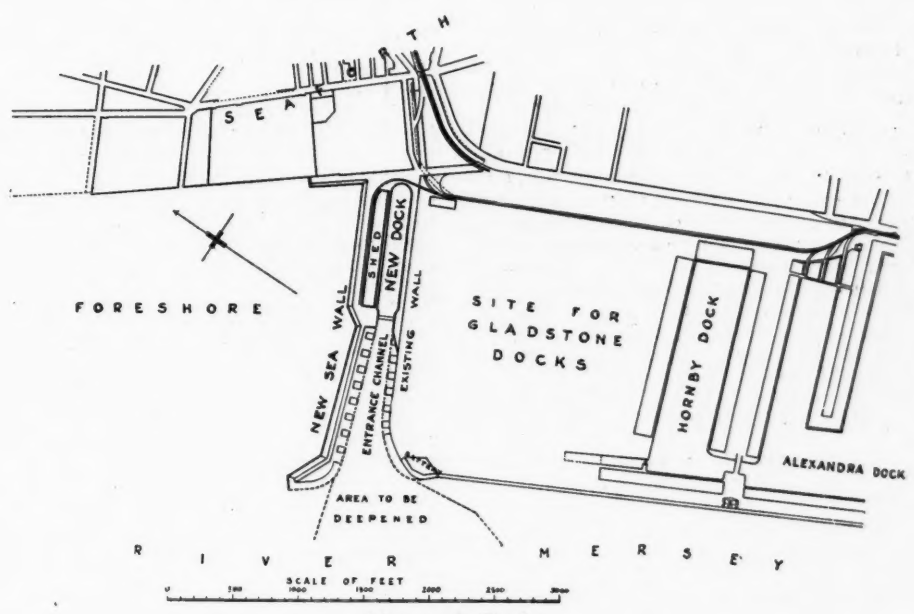
Chemical Composition and Setting of Cements. IN a paper read to the officers of the technical division of French Army Engineers M. Bied first discusses the chemical composition of cements and hydraulic limes, and afterwards deals with the theoretical aspect of setting. In connexion with the chemistry of cement it deserves to be remembered that silicates denoted by the same formula may be either hydraulic or totally inert, and that dicalcic silicate may exist in three allotropic forms, each characterised by different hydraulic properties. Hydraulic lime is a mixture of natural cement, pure calcium hydrate, and inert matter, and according to the proportions of these elements its hydraulicity may be very feeble or particularly strong. Le Chatelier gives the following formulæ for the composition of good cements—

$$\frac{CaO, MgO}{SiO^2+Al^2O^3} \leqslant 3 \quad \text{and} \quad \frac{CaO, M_2O}{SiO^2(Al^2O^3+Fe^2O^3)} \geqslant 3$$

The author demonstrates the complexity of the mechanism of the setting and hardening of cements, pointing out that these processes involve a chemical phenomenon (hydrolytic decomposition), a physical phenomenon (crystallisation), and a mechanical phenomenon (hardening). Le Chatelier has shown that hardening may take place with a very small proportion of water, and that the form of the crystals influences the resistance of the material after setting has taken place.

Another subject considered in the paper is the cause of the decomposition of hydraulic lines and cements in sea-water and in water impregnated with sulphates, and in conclusion the author refers to the importance of the personal element in tests, a factor which renders difficult any reliable comparisons of investigations made in different laboratories.

New Harbour Works at Bordeaux. WORKS now under construction for improving the port of Bordeaux include extension of the staging on the Quai de Queyries by 312 ft. downstream and 328 ft. upstream, the construction of a new dock with the maximum dimensions of 1,500 ft. by 500 ft., and the conversion of the Cale du Médoc into a vertical quay. A project which only awaits sanction by the Senate contemplates the expenditure of 3,200,000*l.* during the next ten years for making the port and its approaches suitable for vessels drawing 28 ft. The scheme comprises the extension of the port itself and the improvement of the Gironde and the Garonne. The port extensions include the reconstruction of old quays, the construction of new quays, several new dock basins, a ship canal with a large lock giving access to five basins. When these and the river improvement works have been executed the capacity of the port will be increased to about 8½ million tons of merchandise a year.



Liverpool Dock.

Dock Extensions at Liverpool. ONE of the main features of the scheme adopted in 1908 by the Mersey Docks and Harbour Board was the provision of docks suitable for the gigantic liners which are characteristic of modern ocean traffic. The project, involving an expenditure of 3¼ millions, contemplated the construction of various new docks extending from the Hornby Dock to Seaforth, but owing to unfavourable trade conditions it has remained in abeyance until a few days ago. The Board have now decided to commence operations by building a large dock at the north end of their available land for the accommodation of vessels up to 1,000 ft. long and 110-ft. beam.

The works comprise the construction of an entrance channel about 1,400 ft. long by 400 ft. wide at the mouth, a dock 1,020 ft. long by 170 ft. wide, with a 120-ft. entrance, transit sheds 900 ft. long by 100 ft. wide, and a new sea wall on the Seaforth foreshore, bordering the entrance channel and quay alongside the new dock. The depth of water in the dock and entrance channel will be 35 ft. at low tide, and 45 ft. at high tide. Although doubtless adequate for vessels likely to be built within the next few years, the minimum depth may have to be increased after a time if shipbuilding continues to develop on present lines.

The estimated cost of the new works is put at 500,000*l.*, and some three years will be required for their completion. It should be noted that the new dock will be available for use as a graving dock as well as for the purposes of ordinary traffic, a principle adopted in the design of the Huskisson Dock half a century ago.

Portable Acetylene Lights for Builders. A VERY convenient form of acetylene lighting employed during the construction of the Council House, Birmingham, consisted of a cylindrical generator having a vertical pipe standard fitted at the top with a swivelling arm carrying the lamp. An outfit of this type capable of giving 350 candle-power can be readily moved from place to place by one man. The consumption of carbide is stated at 12 oz. per hour, and the lamp will burn for twelve hours without recharging. Similar plants are available up to 3,500 candle-power, and should be found useful to contractors and others requiring artificial light for nightwork in places where gas and electricity are not obtainable.

Novel System of Lighting a Town Hall. ON the occasion of a banquet to the President of the United States the New Jersey Town Hall was treated after the manner of an Italian pergola by the construction of a framework on the ceiling decorated with branches of artificial apple blossom. Illumination was provided by two long tubes of the Moore vacuum light, one encircling the pergola and the other carried along the balcony. The tubes, each 150 ft. long by 1¾ in. in diameter, were filled with nitrogen, giving a rose-yellow tint, which is said to be most effective

Suggested Steel Arch for the Quebec Bridge. IN an American contemporary Mr. Charles Worthington recently proposed the construction of a steel arch with the span of 1,800 ft. instead of a cantilever structure across the St. Lawrence River at Quebec. The author believes that an arch of this magnitude would not only be practicable, but that the cost would compare favourably with that of a bridge of the cantilever or the suspension type, providing adequate abutments were provided to take the enormous thrust involved. This part of the problem is met by the proposal of a concrete strut 20 ft. deep by 98 ft. wide, extending from the base of each end pier to solid rock beneath the river banks. To overcome purely structural difficulties Mr. Worthington propounds the novel idea of building a temporary suspension bridge across the site, so that the steel voussoirs could be adjusted and held in place during erection of the arch. The latter as designed would consist of four parallel ribs 9 ft. wide by 42 ft. thick at the springings, and 21 ft. thick at the crown. An arch would certainly be far more pleasing in appearance than any other form of bridge, but considerable doubt may reasonably be entertained as to the possibility of securing rigid support for the independent voussoirs without making the temporary suspension bridge a very costly affair

---

Painting Concrete Surfaces. A PAPER read to the American Society for Testing Materials by Mr. Charles Macnichol describes a method of obviating the trouble caused by the action of cement upon the oil in paints employed for covering concrete surfaces. The author recommends the application of zinc sulphate dissolved in an equal weight of water, the solution to be laid on by an ordinary brush after the concrete has become dry. Referring to this preparation, Dr. A. S. Cushman states the opinion that the effect of the zinc solution is to fill the pores of the concrete with a mixture of gypsum and zinc oxide, neither of these compounds being injurious to oil paint. Another advantage resulting from the filling of the pores is to prevent the paint from penetrating too deeply into the concrete.

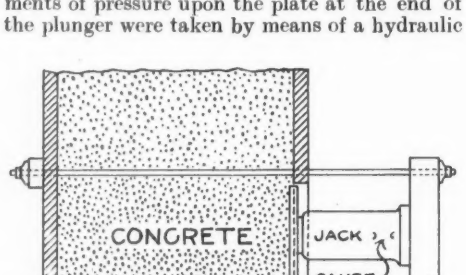
Bursting Speed of Pulleys. AT a meeting of the American Society of Mechanical Engineers Professor C. H. Benjamin described a series of experiments on the bursting speeds of pulleys of about 24 in. diameter. The following are peripheral speeds per second:—

Split wood pulleys	220-260 ft.
Built-up steel pulleys	235 ft.
Solid wood pulleys	275 ft.
Solid web paper pulleys	300 ft.
Solid cast-iron pulleys	350-390 ft.

These results are somewhat at variance with the opinion entertained by many users of power-transmission appliances, but at the same time they indicate that a very high factor of safety is furnished by all pulleys of sound design and construction, as peripheral speeds rarely exceed 80 ft. per second, and are generally very much less.

Pressure of Concrete upon Moulds.

TESTS conducted at the University of Illinois by Messrs. L. E. Ashley and B. A. Abrams have furnished data which are of practical value to designers of moulds for concrete and reinforced concrete. The apparatus consisted of a box 3 ft. wide having two openings in the side, each with the area of rather more than 1 sq. ft., and closed by a steel plate of corresponding size attached to the plunger of a hydraulic jack placed horizontally. Each jack was held in position by a timber support, and two tie rods with a cross bar, the rods passing through the box and the bar being disposed across the outer end of the jack, so as to obviate horizontal displacement by pressure of the concrete. Measurements of pressure upon the plate at the end of the plunger were taken by means of a hydraulic



gauge. A wet mixture of concrete in the proportions of 1 : 2 : 4 was deposited in layers 6 in. thick, and observations were taken after each layer had been tamped. The following tabular statement gives the average results deduced from readings at the two gauges :—

Head of Concrete.	Average pressure per sq. ft.
In.	Lb.
12	63·5
17	82·8
24	136·0
30½	184·0
37½	233·0
44½	293·0
61	338·0
69	446·0
74	470·0

So far as we are aware the only other data of the kind available are those obtained by Major Shunk two years ago, and there is reason for believing that owing to friction in the apparatus employed the pressures then observed were somewhat higher than those actually prevailing.

New Joint Dock, Hull: A Foundation Problem.

THE dock now in course of construction at Hull for the North-Eastern Railway and the Hull and Barnsley Railway forms part of a scheme providing for the reclamation of some 600 acres from the estuary of the Humber by means of chalk embankments 50 ft. high by 40 ft. wide at the base, and 8 ft. wide at the top. These embankments are now almost finished, and work upon the new dock well advanced. The dock walls are 52 ft. high by 32 ft. wide at the base, to 6 ft. wide at quay level, the materials employed being concrete with a lining of blue brick and granite coping. The dock provides a water area of 32 acres, which will be increased at some future date by three additional arms 1,350 ft. long by 350 ft. wide. Access from the river will be afforded by a lock 750 ft. long by 85 ft. wide, provided with three sets of gates. Owing to the penetration of water-bearing strata difficulties have been encountered in connexion with the foundations of the south wall of the dock and all the foundations of the lock, necessitating the use of sheet piling to the depth of 47 ft. below dock bottom level to cut off the springs. In the case of the lock it was found necessary to enclose the site entirely by steel piling, thus virtually forming a huge steel tank or cofferdam. The security of this barrier may be gauged by the statement that the soil through which the piles had to be driven was very hard and that in some places as many as 800 blows from a 2-ton monkey falling through 8 ft. were required per foot of penetration. Previous experience at Hull has already demonstrated the serious risks attending deep foundation work in the water-bearing strata, but there can be no doubt as to the efficiency of the precautions adopted in connexion with the construction of the new dock.

Coast Protection Works at Southwold.

IN January, 1908, the cliff at Southwold was in such condition as to cause injury to various houses near the edge, and the foreshore was denuded for a length of about three-quarters of a mile, the only protection being timber breastwork at the foot of the cliff. Eleven new groynes have now been completed from the old timber work to a point below low-water level. The groynes are formed of pitch-pine piles 8 in. square by from 16 to 28 ft. long, driven in pairs at intervals of 8 ft., with 3-in. planks secured between them by iron bolts. To permit the operation of driving to be conducted at all states of the tide the piles were made long enough for the construction of temporary staging above water level, the driving engine being moved forward after each pair of piles had been driven. It is stated that the accumulation of beach material has already been sufficient to set back high-water level for a distance of some 50 ft. or more from the old breastwork. Additional planking is being placed as the beach grows in height, and when the desired result has been attained the groynes will be trimmed off to a uniform slope.

Quartz Tube Mercury Vapour Lamp.

A NEW type of the mercury vapour lamp which should prove useful for lighting streets and open spaces is formed by the employment of a special quartz glass tube permittting the development of much higher temperature than that previously attained. At the high temperature of the tube the line spectrum of mercury exhibits a whitish yellow light tinged with green and containing a distinct red constituent. In order to absorb ultra-violet rays a specially dense diffusing globe is employed. Lamps of this type have already been introduced in Paris giving 1,000 and 2,000 candle-power with the low specific consumption of ·25 watts per candle. They are said to require practically no attention during their average life of 2,000 hours, and to give an exceedingly soft illumination characterised by exceptionally low intrinsic brilliancy.

Strength of Metallic Lamp Filaments.

A SIMPLE method of testing the resistance to shock of metallic filaments is the following: A small india-rubber ball is allowed to roll down an inclined plane and infringe upon the base of the lamp bulb, the distance of roll being gradually increased until the filament breaks. In this way the durability of different types of lamp can be tested. Experiments so conducted by Mr. T. Muller showed low voltage high candle-power lamps to possess the greatest strength, but it appears to have been difficult to draw conclusions regarding the relative fragility of lamps of the same class. Filaments were much more difficult to break when incandescent than when cold, and it was sometimes found that the supporting glass rods and hooks were more fragile than the filaments.

Fire Resistance of Cinder Concrete.

ABOUT two years ago some walls made of cinder concrete were erected at Columbia University, and since then they have been subjected to five four-hour tests by fire, when the average temperature reached 1,700 deg. F. At the conclusion of each test a stream of water was applied for ten minutes while the walls were hot. Professor Ira H. Woolson states in *Insurance Engineering* that after these tests the walls for all practical purposes are as good as when erected, and he considers that within reasonable limits the percentages of coal and fine material in such cinders have very little effect on their fire-resisting qualities. The pieces of coal which were next to the surface in these walls were burned to ash, but the ash remained in place and acted as a non-conductor of heat.

Accidents to Workmen in Germany.

A RECENT United States Consular Report shows the comparative risks to workmen in a number of German industries. The following list gives the number of accidents per annum per 1,000 workers in various trades :—Carters and drivers, 22·87; quarrymen, 15·67; canal and river boatmen, 14·73; excavators and tunnel workers, 13·95; wood workers, 11·61; iron and steel workers, 11·61; builders' men, 11·42.

Ozone in Ventilation.

BY the use of ozonised air as an adjunct to ventilation in the Chicago Public Library, it is claimed that the reading-room has been completely freed from the obnoxious human odour which has been noticed for years. The ozone generator, consisting of cylindrical brushes separated by glass plates, is about 6 ft. high, 11 in. thick, and 12 in. wide, and is installed in a large air duct in such a way that all the air is forced between the electrodes, across which a potential of 7,000 volts is maintained. The energy required for treating the air is stated to be 660 watt hours for 10,000 cubic feet of air.

Canadian Timber.

THE value of the production of timber in each of the provinces of the Dominion of Canada, in 1908, was: Ontario, $24,399,077; Quebec, $10,838,608; British Columbia, $9,107,186; New Brunswick, $4,081,402; Nova Scotia, $2,873,730; Saskatchewan, $1,576,820; Manitoba, $867,969; and Alberta, $593,244; making an aggregate of $54,338,036. The production of sawn lumber in each of the provinces during the same year was :—Ontario, 1,294,794,000 ft.; Quebec, 690,135,000 ft.; British Columbia, 647,977,000 ft.; New Brunswick, 308, 400,000 ft.; Nova Scotia, 216,825,000 ft.; Saskatchewan, 91,166,000 ft.; Manitoba, 56,447,000 ft.; and Alberta, 41,382,000 ft.

Shifting a Brick Foundation Wall 150 ft. long.

OWING to the projected installation of new machinery, the proprietors of an American paper mill thought it would be necessary to demolish and rebuild a foundation wall 150 ft. long by 16 ft. high, built up of piers 3 ft. thick at intervals of 8 ft. apart, connected by brick arches 21 in. thick. The cost of these operations would have been about 200*l.*, but the contractors proposed as an alternative to move the wall for the required distance of 23 in. at a price which, including new footings, was less than 100*l.*

The procedure followed may be thus briefly described :—The wall was cut into three sections each 50 ft. long; two timber needle beams 8 in. square by 12 ft. long were inserted under each pier, and all of them jacked up to uniform level; on both sides of the wall diagonal struts 4 in. square were fixed to brace the wall and needle beams; by raising the jacks at one side of the wall the brickwork was cracked level near the base, thus making the wall section ready for shifting after wood rollers of 7 in. diameter had been placed under the needle beams and running on carefully levelled planks; and the wall was moved in about twenty minutes by means of five horizontal jacks. The same method was applied to the shifting of the two other sections, but by employing triangular timber frames each of these portions was moved by two screw-jacks.

When the wall had been brought over the new footing, its weight was transferred to the jacks, new brickwork was built between the needle beams to take the place of courses destroyed, and the work was completed by bricks laid in the spaces left by removal of the beams.

Cement Injecting.

IN the construction of the Metropolitan Railway of Paris constant resort is made to injections of cement, sometimes in order to prevent falls from overhead and to strengthen foundations of houses; even more frequently to strengthen the foundations of the railway itself, rendered insecure owing to presence of the "catacombs" or disused quarries. The injection is made by means of a Greathead filler or an alternating current electric pump. Considerable force is used for injecting purposes, good Portland cement and fine sand being used. Taking an average, it is found that a ton of grout can be injected by the Greathead machine at a total cost of 2*l.* 3s., or by means of an alternating current electric pump for 2*l.* The A.C. pump requires about .750 kilowatts per hour.

DANGEROUS STRUCTURES.

THE annual Report of the London County Council for 1908-9 states that during the year there were 4,783 cases of dangerous structures reported to the Superintending Architect and dealt with. The Council, as a temporary expedient, shored up or hoarded in 223 structures. In 188 cases the work of taking down the dangerous portions of the buildings was executed under orders of the court by the Works Department. In consequence of the failure of owners to comply with the requirements of the Council, 761 summonses were taken out. Nine cases were referred to arbitration, with the result that the Council's requirements were upheld in all but one case. During the year 154 neglected structures were inspected and reported upon by the Superintending Architect. In forty-nine of these cases no action was necessary, and in forty-six the works were carried out by the owners of receipt of notice of the Council's requirements. In default of action being taken by the owners, fourteen structures were demolished by the Council under orders of the court, and the remaining cases were under consideration at the end of the year.

LONDON COUNCILS.

Acton.—At the last meeting of the Council the Building By-laws Committee recommended that application be made to the Local Government Board to approve the following new by-law:—"Every person who shall on or after the 1st day of September, 1910, erect a new domestic building other than a building intended and adapted to be used exclusively as a stable, shall provide at the rear of a line, being a continuation of the front main wall of such building, an open space exclusively belonging to such building, and of an aggregate extent of not less than 500 sq. ft., and free from any erection of substantial proportions thereon above the level of the ground, except a water closet, earth closet, or privy, and an ashpit, provided that, if in the opinion of the Council in any particular case hardship will result from requiring compliance with this by-law, the Council may allow the new building to be erected in accordance with by-law No. 3." Mr. Shillaker moved that in addition to the above by-law provision should be made that air space in front of new buildings should provide for the road being 50 ft., and leave 30 ft. for the pavement and forecourts. Mr. Glen said it would be much simpler to reckon the air space at the rear from the main building. He often had a difficulty in advising clients as to where the air space began. The amendment of Mr. Shillaker was carried, as was also the recommendation of the Committee.

Hampstead.—Dr. McCleary, the Medical Officer of Health, in his annual report, writes that during the year several claims were made by owners of property that certain defective combined drains were not legally "drains," for which the owners of the property were responsible, but "sewers," which the Council were under obligation to repair at the cost of the ratepayers. All these claims were successfully resisted. In one of the cases the facts were so unusual as to deserve special mention. In this case the matter arose in January, 1909, owing to the stoppage of the drain of a house in Parliament-hill. When the stoppage was removed, it was found that the drain was so seriously defective as to require reconstruction, and the owner of the house claimed that this should be done by the Council at the cost of the ratepayers, because the drain conveyed drainage from the adjoining house, and was, therefore, in the eye of the law a "sewer." An inspection was made of the premises, and it was found that the drain did, in fact, convey drainage from the adjoining house, the drainage consisting of rainwater and waste water from a bathroom that had been built at the back of the premises. Reference was made to the original drainage plans that were deposited in 1868, when the houses were built, and these plans showed each house drained separately and not in combination. Careful inquiries were made by Mr. Kershaw, who ascertained that each house was, in fact, separately drained in 1868, but that in 1886 the owner built a back addition to each house, and connected the rainwater and bath waste from both houses into the drain of one of the houses, no notice being given to the local authority. He subsequently sold the houses. The name and address of this former owner, who was still living, were ascertained, and the Council, in pursuance of their power under Section 76 of the Metropolis Local Management Act, 1855, entered the premises, and caused the drains of the two houses to be disconnected, so that each drained separately in accordance with the plan originally approved by the local authority. The Council then took out two summonses against the person who had made the combination, one for making a drain without giving notice, the other to recover the cost incurred by the Council in disconnecting the drains. The Bench decided in favour of the Council in both cases, but, owing to the lapse of time, imposed a nominal penalty of 5s., at the same time making an order for the cost of the work. Nothing more was heard of the claim than the drain was a "sewer." Referring to water supply to tenement houses, the report says that during the year the number of houses dealt with under the section was eighty-five. In each house a water tap and a glazed earthenware sink were provided on each floor. The provision of a sink is important, for without it the water tap might become a source of dampness, and cause considerable damage to the house. The section of the General Powers Act makes no provision for a sink, and in some cases the owners, having provided water taps, refused to fix sinks beneath them. In these cases the house appeared to be without the "sufficient drain" required by Section 73 of the Metropolis Management Act, 1855, and after the service of notices under that section the sinks were duly provided. Fears have been expressed that these sinks might be misused and fouled, and so become a source of nuisance. This, however, has not been the experience in Hampstead. The provision of water taps and sinks has lead to an improvement in the sanitation of the premises, and has been much appreciated by the tenants.

Southwark.—The Medical Officer of Health, in his annual report, says that within the last year the leases of a large number of small houses have fallen in, and the property has reverted to the freeholder. In such cases, it is extremely difficult for the owners to decide what is best to be done, whether to pull down the property and erect other dwelling houses, to patch up the existing worn-out houses, or to erect other buildings on the site. The Medical Officer is satisfied, however, that in the inner portion of the borough it is not to the interest of ground landlords to build small houses. The salvation of the borough is for it to become more and more, both in buildings and business, like to the City. The proximity of much of the borough to the City, and the comparative cheapness of the land, should induce property owners as far as possible to make it easy for the City to extend in that direction. In the past few years the erection of warehouses has proceeded very satisfactorily in the district, and with a better means of communication across the river, they may expect to see a greater extension of such premises, which many think would be for the benefit of the borough. It would certainly remove the squalid areas which have so befouled the ancient name of Southwark.

PROJECTED NEW BUILDINGS IN THE PROVINCES.*

ABERDEEN.—Extensions to St. John's Church (30,000*l.*); Chairman of the Committee.

Arundel.—Development of West Arundel Estate for garden city; Messrs. Greenwood & Son, builders, Halifax.

Atherton.—Foundry, Wigan-road, for Messrs. D. & H. Owen.

Barry.—Large iron and steel works; Mr. Dundrett, Secretary, care of Messrs. Barry, Steel and Iron Company.

Belfast.—Block at the Royal Victoria Hospital; the Governors.

Berkhampstead. — Four-storey granary, Lower King's-road; Messrs. H. & J. Matthews, builders, Berkhampstead.

Bideford.—Club premises; Secretary, Bideford Amateur Athletic Club.

Billinghurst.—Infants' school (1,450*l.*); Mr. G. Potter, builder, Horsham; alterations and additions to existing school (650*l.*); Mr. William Pother, builder, Horsham.

Bournemouth.—Extension to workhouse infirmary (16,000*l.*); Clerk, Board of Guardians, Bournemouth.

Bulkington.—Wesleyan chapel, Butt Field; the Trustees.

Chatterton.—Additions to weaving shed for the Chatterton Weaving Company.

Clowne. — Constitutional Institute; the Secretary.

Clydebank.—Alterations and additions, 32-4, Alexander-street, for the Clydebank Co-operative Society.

Cranbrook.—Additions to infirmary; Clerk, Cranbrook Guardians.

Crompton.—Superintendent's house (350*l.*); Surveyor, Crompton Urban District Council.

Dalmuir.—Alterations, Council Chambers; Surveyor, Old Kilpatrick Parish Council.

Dumbarton.—Theatre, Church-street; Mr. A. C. Denny, architect, 37, Church-street, Dumbarton.

Flaxton (near York).—Wesleyan Sunday-school; the Trustees.

Gosforth.—R. C. Church (4,000*l.*); Mr. C. J. Manart, architect, Glasgow; Mr. W. C. Fleck, builder, Gosforth.

Gosport.—Alterations, Fighting Cocks' Inn, Clayhall, for the proprietors.

Gravesend.—Boiler house, etc., for the Imperial Paper Mills, Ltd.

Hetton-le-Hole.—Workmen's club (4,000*l.*); Messrs. Curry & Walton, architects, Newcastle; Mr. R. D. Harrison, builder, Houghton-le-Springs.

Hodthorpe.—Stores and houses for the Worksop Co-operative Society.

Kingston-on-Thames.—Drill hall for the 6th Battalion East Surrey Territorials.

Knowle.—Alteration to asylum (2,900*l.*); Mr. John Hunt, builder, Gosport.

Linton.—Ten houses (1,450*l.*); Mr. Burgess, builder, Linton.

Lochgelly.—Premises for the Lochgelly Co-operative Society.

Madryn.—Adaptation of Madryn Castle as school (45,000*l.*); Mr. J. F. Roberts, Clerk, Carnarvonshire County County, Carnarvon.

Maesteg.—Congregational chapel, Castle-street, Trustees, Zoar Congregational Church.

Maidstone.—Offices and workshops, Roger's Wharf (22,000*l.*); Mr. W. T. Burrows, builder, Maidstone.

Manchester. — Enlargement of Council Chamber (6,000*l.*); Mr. R. F Vallance, Surveyor, Manchester Corporation.

Mansfield Woodhouse.—Wesleyan church and schools, Station-street; the Trustees.

Melton Mowbray.—Alterations, Half Moon Inn, etc., Nottingham-street, for Messrs. Paten & Co.

Middlesbrough.—Enlargement of workhouse; Clerk, Middlesbrough Board of Guardians.

Middleton.—Conservative club, Monmouth-street; the Secretary.

Newtown.—County infirmary (6,000*l.*); Mr. Treasure, builder, Shrewsbury.

North Rigton.—Church (2,000*l.*); Messrs. William Hill & Son, architects, Leeds; Mr. J. T. Wright, builder, Leeds.

Oakenshaw.—Wesleyan Sunday-school; the Trustees.

Patna.—Alterations, etc., school (2,200*l.*); Secretary, Straiton School Board.

Perivale.—A large house is to be erected near the old church, the architect being Mr. A. T. S. Weatherhead, of Colebrooke-avenue, Ealing.

Rampton.—Criminal lunatic asylum (80,000*l.*); Messrs. W. Pattinson & Sons, builders, Ruskington.

Saltney.—Mission church (450*l.*); the Vicar.

Seaham Harbour.—School; Mr. G. Burrell, Surveyor, Seaham Harbour Urban District Council.

South Emsall (near Doncaster). — Primitive Methodist church (1,300*l.*); the Trustees.

Southend.—The Southend Corporation has decided to build a new loading pier at a cost of 10,000*l.*

Spalding.—Salvation Army hall (200 places); the Trustees.

Stirling. — Municipal buildings; Surveyor, Stirling Town Council.

Stokesley.—Alterations at laundry; Clerk, Stokesley Board of Guardians.

Trimdon Colliery. — Church (about 1,000*l.*); Wesleyan Trustees.

Upton-upon-Severn.—Alterations and additions to workhouse; Architect, Upton-upon-Severn Board of Guardians.

Winchester.—Elementary school; Mr. A. H. Johnson, architect, Hilcote, Headbourne Worthy.

Winster. — Primitive Methodist church, Darley-hill; the Trustees.

* See also our list of Competitions, Contracts, etc., on another page.

OBITUARY.

Dr. Michaelis.

The death, at Strasburg, is announced of Professor Adolf Michaelis, the eminent archæologist, aged 75 years. He was Hon. LL.D. of the Universities of Cambridge and Edinburgh and the writer of several learned works. He formerly occupied the chairs of Archæology in Tübingen and Greifswald Universities, and in 1872-1907 was Professor of Classical Archæology at the University of Strasburg, for which he organised the archæological museum.

Mr. Haynes.

Mr. Robert Henry Haynes, M.Inst.C.E., died at Newport, Mon., on August 20, aged 48 years. Having served his pupilage to the late Mr. Kirby, Borough Engineer of Newport, Mr. Haynes was appointed Deputy Engineer in 1883, and ten years afterwards Borough Engineer; he was appointed Waterworks Engineer to the borough seven years ago. He was engineer, jointly with Mr. Arnodin, of the transporter bridge across the River Usk, and shared in the construction of the waterworks at Wentwood, and in other municipal undertakings. Mr. Haynes was a member of the British Association of Water Engineers, the Association of Municipal and County Engineers, and the South Wales Institute of Engineers.

GENERAL BUILDING NEWS.

CHURCH, WOOLACOMBE.

This church is designed to accommodate 500 persons. The cost will be 6,500*l.*, including a low tower. A contract has been signed with Messrs. Dart & Francis, Crediton, to erect at present only a portion of the building, including four bays of the nave, with vestries and heating chamber, for 3,310*l.* It is estimated that this will provide accommodation for about 350 worshippers. The drawings have been prepared by Mr. W. D. Caroe, F.S.A., architect to the Ecclesiastical Commissioners.

CHURCH, GLASGOW.

The Reformed Presbyterian Church, Nicholson-street, Glasgow, is being taken down, and in its place a new edifice will be erected. The new building will have the following accommodation:—On ground floor: Hall, seated for 270 persons; lesser hall, seated for 80 persons; gentlemen and ladies' cloakrooms, etc.; session-room, library, church, kitchen, and storeroom. On first floor: Church, seated for 400 persons; vestry, etc. The contractors for the work are:—Mason, Moses Barlas; joiner, Peter Cumming; plumbers, John Paterson & Co.; slaters, Jas. Stewart, sen., & Son; plasterers, Wemyss & Livingston; glaziers, H. Smith & Co. The architects are Messrs. Miller & Black, F.R.I.B.A., I.A., Glasgow.

CATHOLIC CHURCH, TORRY.

A new Roman Catholic Church is being erected at the junction of Grampian-road with Glenbervie-road, Torry, N.B. The plans have been prepared by Mr. Charles J. Menart, architect, Glasgow, and the building is of granite, with red tiles. Accommodation is provided for 350 persons, and the cost of the structure is estimated at over 4,000*l.* Attached to the church there will be a presbytery house. Mr. David Weir, of Aberdeen, is the builder.

NEW RAMSEY CHURCH.

At Ramsey, Isle of Man, a new Roman Catholic church has been built. The church has been erected at a cost of 5,000*l.* from the plans of Mr. Gilbert Scott.

SCHOOL, GLASGOW.

A new girls' school is to be erected in Kingarth-street, South Side, Glasgow. Six sets of plans have been submitted and examined, and those labelled "D" have been selected. The architects of the selected plans are Messrs. Thomson & Sandilands, Glasgow. In the report prepared for the Governors of Hutcheson's Educational Trust, by Mr. John Baird, I.M., the cost of the building to be erected by Messrs. Thomson & Sandilands is estimated at 20,367*l.* The plans are to be sent to the Educational Department.

SCHOOLS, GRAISELEY, WOLVERHAMPTON.

These schools have been erected on a site two acres in extent. They consist of two blocks of buildings, mainly one-story in height, and provide accommodation for 400 boys, 400 girls, and 300 infants, with provision for an additional classroom for each department; also for a cookery and manual instruction centre. The infant block, which is detached from the other, is placed nearest the entrance, and consists of an assembly hall 50 ft. by 30 ft., five classrooms, and private rooms for head and assistant teachers; also hat and cloak room, lavatory, and storerooms for books and apparatus. The accommodation provided in the boys' and girls' department is the same: seven classrooms are provided for each department, with private rooms for head and assistant teachers, hat and cloak room, lavatories, etc. A hall, 70 ft. by 35 ft. is placed between the two departments, having direct access from each, and is intended for the use of both. The buildings have been designed on the pavilion type of plan. Each classroom is entered from an open verandah, though internal doors are provided between classrooms for the convenience of the teachers. The walls are built in bricks, with terra-cotta window sills and brick arches. The roofs are covered with Staffordshire tiles. Internally the walls are lined with salt-glazed tiles up to the level of the window-sills, and are plastered above. The floors of the assembly halls and classrooms are of wood blocks, the entrance lobbies and hat and cloak rooms are laid with terazzo, and the verandahs with granolithic. The heating is on the hot-water low-pressure system. The artificial light is by gas. The contractors for the buildings were Messrs. Willcock & Co. The heating apparatus has been supplied by Messrs. Manley & Co. The desks and furniture have been supplied by Messrs. Illingworth & Ingham, of Leeds, and Messrs. Wake & Dean, of Bristol. The architects are Messrs. Fleeming & Son, of Wolverhampton and Wellington.

COUNCIL SCHOOL, NORTHENDEN.

Some time ago the Sale and Ashton-upon-Mersey sub-committee of the Cheshire County Education Committee decided on the erection of a new Council school in Bazley-road, Northenden, and the new building was opened on the 22nd inst. It provides room for 400 scholars, and, in addition to the ordinary subjects, accommodation has been made for instruction in science, handicrafts, laundry work, cookery, and housewifery. There is also a garden for nature study. The buildings were designed by Messrs. Mangnall & Littlewoods, Manchester, and built by Messrs. Gerrard, Swinton.

SCHOOL, ADLINGTON.

A new infants' day school has been erected at Adlington. The new school replaces the old Christ Church Infants' School, and adjoins the mixed school near to St. Paul's Church. The two schools provide places for 390 scholars, 270 being in the mixed school, and 120 in the infants'. Messrs. Ormrod & Pomeroy, of Bolton, were the architects, and Mr. Leonard Fairclough, of Adlington, the contractor.

TRADE NEWS.

Messrs. Shackell, Edwards, & Co., Ltd., an old-established firm of varnish and colour manufacturers, Red Lion-passage, Fleet-street, E.C., have equipped their premises with the most modern machinery and appliances known to the trade. They have always been strongly opposed to the use of substitutes for those materials which are recognised as being the best possible for the manufacture of first quality goods.

The Cherry Tree Machine Company, Ltd., laundry engineers, Blackburn, have received instructions from the War Office to supply an installation of steam power laundry machinery, including metal washer, starching machines, mangling machines, etc., for the Military Hospital at Bloemfontein.

We understand that the Easton Lift Company, Ltd., "Express" Works, Short-street, Southwark, S.E., has been confused with Messrs Easton & Sons, of 28-30, Southwark Bridge-road, Southwark, S.E., and we are asked to state that there is no connexion between the two companies.

The Yorkshire Hennebique Contracting Company, Ltd., Leeds, have just secured the contracts for two large bridges over the main lines of the L. and Y. and G. C. Railways at Ashton-under-Lyne, in connexion with the extension of Richmond-road. These bridges are to be erected on the Hennebique system of ferro-concrete.

Messrs E. H. Shorland & Brother, Ltd., of Failsworth, Manchester, have just supplied their Warm Air Ventilating patent Manchester Grates to All Saints' Institute, Southampton.

Messrs. F. McNeill & Co., Ltd., Lamb's Buildings, Bunhill-row, E.C., have called our attention to the difficulty experienced by some architects in obtaining on their jobs McNeill's felts, although they had specified for them. They point out that the way to guarantee the use of their standard quality felts is to specify "Lion Brand."

SANITARY AND ENGINEERING NEWS.

BATTERSEA BRIDGE.

The roadway, 24 ft. wide, is to be widened to 26 ft. 6 in. in order to take the conduit tramway, by two side-lines, from Beaufort-street, Chelsea, to Battersea Park-road. A minimum depth of 1 ft. 10 in. for the conduit will be obtained by raising the roadway about 6 in.; the roadway consists of granite setts laid over a stratum of concrete, carried upon cantilevers formed by the arched ribs and the iron standards, with their cross bracing, the curved plates being from 1 ft. 4 in. to 1 ft. 6 in. in depth. The bridge, having five segmental arches of cast-iron ribs resting upon granite piers, was constructed for the late Metropolitan Board of Works by Messrs. Williams, Son, & Wallington who contracted, for 143,000*l.*, after designs by Sir Joseph Bazalgette and Mr. Edward Bazalgette, in 1887-90. The old wooden bridge (illustrated in the *Builder* of January 7, 1888) was erected by Lord Spencer, and other riparian owners, at their own charges in terms of an Act of 1766, to replace Chelsea Ferry. It was built at a cost of about 16,000*l.* in 1771-2, by Phillips, carpenter, after designs by Henry Holland, and very much after the manner of old Putney Bridge. The contractors for the new work are Messrs. Dick, Kerr, & Co., Ltd.

STAINED GLASS & DECORATION.

WINDOW, ST. JOHN BAPTIST CHURCH, HOLLAND-ROAD.

The great rose window at the west-end of this church has just been filled with stained glass, by Messrs. Percy Bacon & Brothers, of London, as a memorial to the late Mr. John Knight, and is the gift of his son, Mr. Charles N. Knight. The large centre opening is in the form of a cusped circle, and contains a crowned figure of the Virgin with the Holy Child, with cherubs in the cusps. Surrounding these are twelve wedge-shaped panels, each containing an angel, with varied coloured wings, each holding part of a continuous scroll, running through all the panels, inscribed with Latin words from the Creed, and having reference to the Incarnation. The outer part of the window consists of twelve quatrefoils, and in each is represented some Biblical figure, commencing with Adam, and finishing with St. Joseph. On account of the obscure lighting of the church, the background of the whole work is of white glass.

MISCELLANEOUS.

GAS LIGHTING IN PALL MALL.

The City of Westminster Council have ratified a contract with the Gas Light and Coke Company for the lighting of all the chief thoroughfares—those in the parish of St. George, Hanover-square, excepted, under existing contracts—with an installation of high-pressure lights, varying from 180 to 3,000 candle-power. Preparations have been made for laying new mains in the Piccadilly and Pall Mall district forthwith. Thus it comes about that a return to the old method will take place in Pall Mall, which was the first street in London to be lighted with gas. Following William Murdoch's experiments in Birmingham and Manchester, F. A. Winsor lighted the old Lyceum Theatre, in the Strand, in 1803-4: he then established a New Light and Heat Company, and on January 28, 1807, illuminated one side of Pall Mall, and, shortly afterwards, the gardens of Carlton House. The Gas Light and Coke Company was formed 1810-2, in Cannon-row, and in the winter of 1814-5 the general lighting of London with gas was in progress, despite the vaticinations of Sir Humphry Davy and other scientific men.

FOUNTAIN, ROYAL EXCHANGE.

In the paragraph relating to this work which appeared in our last issue Mr. Joseph Whitehead is referred to in connexion with certain works. We are asked to deny explicitly the accuracy of the statement associating him with this work.

LABOUR EXCHANGES.

The July returns set out in the *Board of Trade Labour Gazette* relate to 105 exchanges, and show that the total number of applications amounted to 118,588 during the month of July—a decrease of 32,968 as compared with the total in June. The highest number of applications on the register, with percentages, were in respect of building and constructional works, 12·6; general labourers, 11·5; and metals, machines, implements, and conveyances, 13·3. On July 29, there were on the register, 39,746 notified vacancies, 33,813 vacancies filled, and 72,670 remaining applications whereof 21,286 were in London, 3,139 in Glasgow, and 2,965 in Birmingham.

BEQUESTS BY THE LATE SIR F. SEYMOUR HADEN.

In terms of his testamentary dispositions, the late Sir Francis Seymour Haden, F.R.C.S., Founder and President of the Royal Society of Painter-Etchers, and Member of the Institute of France, who died, aged 92, on June 1, has left his large copy of "The Marriage at Cana" (Paul Veronese), by Fantin Latour, to the National Gallery of British Art, Millbank, and some etchings to Sir Edward M. Thompson for presentation to the Trustees of the British Museum.

SKINNERS' COMPANY'S SCHOOLS.

With the approval of the Board of Education, an order has been made by the Charity Commissioners authorising payments to two of the foundations of the Skinners' Company out of their Hunt and Atwell Charities. The Commissioners assign 3,000*l.* of the accumulated funds to the Middle School for Girls, Stamford-hill, towards the cost of new and improved school buildings, and 10,000*l.* for the same purpose in respect of the Company's Boys' School at Tunbridge Wells. The endowments have their origin in a bequest to the Company by Thomas Hunt in 1557, with which they bought property in Rood-lane and Fenchurch-street, and established a loan-fund.

and in Lawrence Atwell's bequest in 1588, of lands and tenements in Godalming and Fenchurch-street. Large accumulations having arisen of the rents derived under the Atwell and Hunt charities, the Company were enabled to establish the two schools in 1887-90, supplementing their endowments with a separate sum of 10,000*l.* from another source.

BACK-TO-BACK HOUSES, EDINBURGH.

A meeting of Edinburgh Dean of Guild Court was held on the 11th inst., when warrant was granted to erect two tenements on the south side of High-street, Portobello. The Dean of Guild said the Court were pleased to observe that the plans showed an effort was being made to get rid of the back-to-back house. A petition was presented for a warrant to execute alterations on house property at 40, Buccleuch-street. Dean of Guild Carter said what was actually proposed was the conversion of the existing property into two houses back-to-back. The petition would have to be taken back in order to see what could be done to prevent the back-to-back principle coming into play. What was wanted was to get through-ventilation from one side of a house to another. On behalf of petitioner, it was suggested that warrant should be granted for part of the work, but the Dean of Guild said the Court refused to consider the petition in its present form, and desired the matter to be looked into and the petition remodelled.—*Scotsman.*

KING EDWARD STATUE AT ABERDEEN.

The Executive Committee in connection with the scheme for the erection of a granite statue in Aberdeen to the late King Edward have visited a number of suggested sites in company with Mr. Alfred Drury, A.R.A., the sculptor chosen to carry out the work. Among the sites suggested are those in front of Marischal College, in Castle-street, at the junction of Blackfriars-street with Schoolhill, and in Union-terrace, near the Public Library and His Majesty's Theatre. The Committee have agreed to select the site in Rosemount Viaduct, at the junction of Blackfriars-street and Schoolhill. The statue will be in the centre of the street, and within a short distance of the statues of Wallace, General Gordon, and Burns, and in the neighbourhood of the proposed new technical college.

ROMAN DISCOVERIES AT LINCOLN.

In the course of excavations for the foundation of a water tower in Westgate in connection with the new Lincoln water supply, workmen have discovered many interesting Roman relics. The site of the tower forms practically a square 63 ft. across, and a trench has been dug 14 ft. or more deep, leaving the centre, about 42 ft. across, unexplored. The spot was at one time the north-west corner of a Roman fortress, and a small portion of a Roman wall has been bared and broken into. This shows "herring-bone" work, and is exactly similar to the outer wall of the city. There are layers of tiles bound together with wonderful mortar, and a fine piece of the work has been secured for the local museum. One tile is exceedingly interesting. In the firing an accidental glaze has been produced, and, running over the surface, has deposited the rich colouring which came into general use for pottery many centuries later. Several Roman coins have been unearthed, the greater portion being of Claudius, 41 to 54 A.D. Numerous pieces of pottery have been unearthed. Many of them are decorated with scrolls, and wreaths, and festoons, with human and animal figures and fine floral designs, all standing out in moulded relief. Nearly all these objects are to be deposited in the City and County Museum.—*Yorkshire Post.*

ARBITRATION AWARD *re* DOMESTIC SUPPLY SERVICES.

The National Association of Master Heating and Domestic Engineers inform us that the Executive Council of the National Federation of Building Trades Employers of Great Britain and Ireland have now officially approved of the Board of Trade Arbitrator's Award, dated November 30, 1909, by passing the following resolution, viz.:— "The Council endorses the letter and request of the Heating Engineers in regard to the award in the Leicester Demarcation Case, and recommends the Members of the Federation to observe it." The request referred to, was that their members would follow the lines of demarcation laid down by the Arbitrator. The resolution adopted will have the effect of securing this in the building trades generally throughout the whole country.

PLUMBERS VERSUS HEATING AND DOMESTIC ENGINEERS.

Referring to the article in our issue of 23rd ult. (page 108), we are informed that the joint resolution of 1902 (of which we expressed approval, and which the National Association of Master Heating and Domestic Engineers has adhered to all along), was adopted at a conference held in London (not Leicester) between the two National Societies then representing both sides, and that the Resolution applied throughout the whole country. The following is a copy of the Resolution:—"At a meeting held May 22, 1902, it was mutually resolved by the representatives of the National Association of Master Plumbers of Great Britain and Ireland and the Institution of Heating and Ventilating Engineers that in future it be observed that all lead work be considered plumbers' work, but that a neutral line be taken as regards all iron, brass, copper, or other metal work, which may be executed by engineers or plumbers." Proposed by Mr. D. M. Nesbit, London, on behalf of the Institution of Heating and Ventilating Engineers. Seconded by Mr. J. H. Taylor, Huddersfield, on behalf of the National Association of Master Plumbers, and unanimously agreed to.

GOVERNMENT CONTRACTS.

The following tenders have been accepted during the past month by the Government Departments named:—*Admiralty, Works Department:* Works services, additions, electric light and power station, new chimney, H.M. Dockyard, Devonport—Messrs. Wakeham Bros., Friary-yard, Tothill, Plymouth; school of music, band practice hall, R.M. Barracks, Eastney—Ditto. *War Office:* Works services, additional accommodation for depôts, Cavan—Mr. A. McLean, Belturbet, Co. Cavan; alterations and additions, M.S. quarters, Salamanca and Talavera Barracks, Wellington Lines, Aldershot—Messrs. Martin Wells, & Co., Ltd., Aldershot; camp services, Aberystwyth—Mr. J. C. Vaughan, 27, Commercial-strert, Hereford; completion of superstructure of extensions to workshops, Balloon Factory, South Farnborough—Messrs. Geo. Kemp & Co., Elms-road, Aldershot; construction of slip-way, West Blockhouse, Milford Haven—Messrs. Davies & Griffiths, King William-street, Pembroke Dock; erection of officers' quarters, Bulford—Mr. A. J. Colborne, County-road, Swindon; erection of tent, repairing store, ordnance depôt, York—Mr. Wm. Bellerby, Hungate Saw Mills, York; erection of vehicle shed and mobilisation store, Newbridge—Messrs. H. Laverty & Sons, Ltd., 12, Cambridge-street, Belfast; extension, clothing store, Island Bridge Barracks, Dublin—Ditto; extension, pier, Calshot Castle—Messrs. E. & A. Sprigings, Winstanley-road, Portsmouth; heating and hot water services, Royal Military College, Sandhurst—Messrs. E. Deane & Beal, Ltd., 1, Arthur-street East, E.C.; heating installation, R.E. Institute, Brompton Barracks—Messrs. H. J. Cash & Co., Ltd., Caxton House, S.W.; improvements and additions, married quarters, Richmond Barracks, Dublin—Messrs. J. & R. Thompson, Ltd., Philipsburg-avenue, Fairview, Dublin; internal wiring institution, Ewshott Camp—Messrs. G. E. Taylor & Co., 8, Bush-lane, E.C.; periodical works services: Chatham—F. Holdsworth, 32, Saltaire-road, Shipley; Exeter, Bristol, and Okehampton—Messrs. A. Bagnall & Sons, Shipley, Yorkshire; Maryhill Barracks, Glasgow—Messrs. A. Bankier & Co., 30, Cowcaddens-street, Glasgow; Gosport—Messrs. A. Bagnall & Sons, Shipley; Gravesend—Mr. F Holdsworth, 32, Saltaire, Shipley; plastering, married quarters, Bordon—Messrs. Martin Wells & Co., Ltd., Aldershot; remaking part of parade ground, Caterham—Messrs. Thos. Wood & Sons, Crockenhill, Swanley, Kent. *Office of Works:* Builders' work, erection, Glasgow, Cubie-street, telephone exchange—Mr. F. Rodger, 22, McKinlay-street, Glasgow; extension Kirkcaldy post-office—Messrs. D. Wishart & Co., Smeaton-road, Kirkcaldy; erection, Llanelly post-office—Messrs. W. Bowers & Co., Bath-street, Hereford; erection, Malton new post-office—Messrs. R. Neill & Sons, Strangeways, Manchester; Holloway Money Depôt (second contract)—Messrs. Leslie & Co., Ltd., Kensington-square, W.; erection, North Shields telephone exchange—Mr. G. Park, Tynemouth-road, North Shields; erection, Putney telephone exchange—Mr. F. G. Minter, Ferry Works, High-street, Putney; erection, Scotland Yard stables—Ditto; fittings, New G.P.O., King Edward Building (contract No. 8)—Educational Supply Association, 42, Holborn-viaduct, E.C.; Ditto (contract No. 9)—Messrs. King & Scarborough, 240, Kingsland-road, N.E.; Ditto (contract No 10)—Educational Supply Association, 42, Holborn-viaduct, E.C.; heating, lighting, ventilating, extension, British Museum, steam boilers—Messrs. E. Heaton & Son, Star Boiler Works, Holt Town, Manchester; heating and ventilating, Edinburgh Royal Scottish Academy—Messrs. Midland Heating and Ventilating Company, Ltd., 82, Upper Trinity street, Birmingham; electric lighting—Messrs T. Clarke & Co., 129, Sloane-street, S.W.; heating chamber and underground ducts, National Gallery of Scotland—Messrs. W. Finlayson & Son, Pilrig Works, Balfour-street, Leith; installation, boiler, Royal Courts of Justice—Messrs. Babcock & Wilcox, Ltd., Oriel House, Farringdon-street, E.C.; steelwork, Glasgow, College-street Labour and Telephone Exchange—Messrs. Bladen & Co., Ltd., Parkhead Girder Works, Parkhead, Glasgow.

THE ROYAL PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

The annual exhibition of photographs by the Royal Photographic Society, which, for the last ten years, took place at the New Gallery, is held this year at the Royal Water Colour Society's Gallery in Pall Mall. This year, as last, the Society has asked that the processes by which the pictures are produced should be stated, and a fair proportion of the exhibitors have responded to the call, and it is possible to gauge, with some approach to accuracy, the extent to which these processes rise and fall in the estimation of the best workers. Bromide prints, which suffered a slight eclipse last season, take the premier position this year; the recently invented bromoil process is not far behind in numbers. There are few examples of photographs produced in colour by the oil process, but these few are good, and further advance may be expected as workers acquire facility in the use of their materials. The collection of autochrome and other transparencies in colour is a small one, some eighty in all, including the scientific examples. The autochrome far outnumber the others, but there are one or two examples of the Dufay Dioptichrome process. A few transparencies by the Sanger Shepherd, or triple film process, are to be seen with other technical subjects in the scientific section. The exhibition is open morning and evening, and the lantern lectures are delivered on Mondays, Wednesdays, Thursdays, and Saturdays.

PRESENTATION.

On August 20, at Minerva House, Bevis Marks, the staff of Messrs. Pinchin, Johnson, & Co., Ltd., varnish, colour, and paint manufacturers, presented their managing director, Mr. Albert C. Hill, with a gift of silver and an illuminated album, containing the signatures of the subscribers, to mark the occasion of his silver wedding. The Secretary of the company (Mr. J. H. Gray), in making the presentation, said the growth and prosperity of the firm was the result of the able management of Mr. Hill, while the comfort and harmony in which they were all able to work was also in a great measure due to his consideration and fairness to everyone. Mr. Hill suitably replied.

THE HOMELAND ASSOCIATION, LTD.

The King, through Sir Arthur Bigge, has informed The Homeland Association that he will be glad to continue to receive the publications issued by that Society, thereby maintaining the interest in the Association shown for several years by King Edward. The special work of the Homeland Association is the preparation of a topographical survey of our own country and the encouragement of touring in the United Kingdom. The result is published in the series of Homeland Handbooks and Homeland Reference Books.

CAPITAL AND LABOUR.

PLUMBERS' DISPUTE AT LIVERPOOL.

At the new buildings of the Royal Liver Friendly Society, Liverpool, the operative plumbers, both locally and through their central executive, claimed the domestic services, and went on strike for a short period. The heating engineering contractors (members of the National Association of Master Heating and Domestic Engineers) refused to make concessions, and passed the matter on to the Association. The dispute has now terminated by the plumbers giving way.

PATENTS.

APPLICATIONS PUBLISHED.*

17,112 of 1909.—William Pike Gibbons and John Ridley Masters: Vertical gas retorts.

17,367 of 1909.—William James Reid (Reinforced Concrete Pipe Company): Reinforced concrete pipes.

17,381 of 1909.—William Edward Lake (Pine Street Patents Company): Process of, and apparatus for, making cement.

17,636 of 1909.—Frederick Eaton: Window-blind clips.

* All these applications are in the stage in which opposition to the grant of a patent upon them can be made.

PATENTS—*Continued on page 254.*

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, iv.; Contracts, iv. vi. viii. x.; Public Appointments, xvii; Auction Sales, xxiv.

Certain conditions, beyond those given in the following information, are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bonâ-fide tender unless stated to the contrary.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

***** It must be understood that the following paragraphs are printed as news, and not as advertisements; and that while every endeavour is made to ensure accuracy, we cannot be responsible for errors that *may* occur.**

Competitions.

AUGUST 31.—**Gorleston-on-Sea.**—INSTITUTION FOR BLIND AND DEAF CHILDREN.—The Governors of the East Anglian Institution for Blind and Deaf Children invite plans and designs for a new building to be erected at Gorleston-on-Sea. The competition will be confined to architects having an office or residing in the areas of the following education authorities:—Cambridgeshire, Isle of Ely, Lowestoft, Norfolk, Norwich, East Suffolk, and Great Yarmouth. Copies of the instructions will be sent upon receipt of a remittance for 10s. Mr. D. O. Holme, Clerk of the Governors, Castle-chambers, Norwich.

SEPTEMBER 1.—**Kingstown, Co. Dublin.**—CARNEGIE LIBRARY.—The U.C. offer a first and second prize of 50*l.* and 20*l.* respectively for the best set of plans for the new Carnegie Library to be erected at Lower George's-street, Kingstown. Plans of the site, together with conditions of competition, can be obtained upon application to Mr. J. Sherlock Vaughan, Town Clerk, Town Hall, Kingstown, and on payment of 1*l.* 1s.

SEPTEMBER 5.—**Sheringham.**—COUNCIL OFFICES.—The Sheringham U.D.C. invite designs for new Council offices. For further particulars see advertisement in our issue of July 30.

SEPTEMBER 10.—**Folkestone.**—NEW SECONDARY SCHOOL.—The Borough of Folkestone invite designs from architects (being Fellows, Associates, or Licentiates of the R.I.B.A., or members of the Society of Architects) for a new secondary school to accommodate 150 boys. For further particulars see advertisement in our issue of July 30.

SEPTEMBER 15.—**Belfast.**—ADDITIONS TO THE QUEEN'S UNIVERSITY.—The Senate invite designs for the enlargement of the present buildings at a cost of about 52,000*l.* Full particulars, with plan of site, etc., can be obtained on application to Mr. J. M. Finnegan, B.Sc., Secretary, the Queen's University, Belfast, on payment of 2*l.* 2s.

SEPTEMBER 19.—**Maesteg.**—ALTERATIONS AND ADDITIONS.—The Maesteg Town Hall Committee invite designs for proposed alterations and additions to the Town Hall and Market Hall. For further particulars see advertisement in our issue of July 23.

OCTOBER 1.—**Antwerp.**—SCHEME FOR LAY-OUT OF SURROUNDINGS AND SITE OF FORTIFICATIONS ABOUT TO BE ABOLISHED.—Three premiums are offered, viz., 1,000*l.*, 400*l.*, and 200*l.* Conditions may be seen at Commercial Intelligence Branch of the Board of Trade, 73, Basinghall-street, E.C., and obtained from the "Commission d'études de l'aménagement de l'agglomération anversoise," Rue du Jardin des Arbalétriers 57, Antwerp, on payment of 100 francs.

OCTOBER 1.—**Denbigh.**—ERECTION OF A PUBLIC HALL, MARKETS, MUNICIPAL BUILDINGS, ETC.—The T.C. invite competitive plans and designs of a Public Hall, Markets, Municipal Buildings etc., which it is proposed to erect at a cost not to exceed 10,000*l.* Particulars, etc., may be obtained on payment of a deposit of 1*l.* 1s. Three premiums are offered, viz., 75*l.*, 30*l.*, and 20*l.*, as first, second, and third respectively. Mr. J. Parry Jones, Town Clerk, Denbigh.

* OCTOBER 31.—**Romford.**—TOWN PLANNING, ETC.—The Town Planning and Modern House and Cottage Exhibition invite designs for houses, cottages, etc., also town plan of Gidea Park, Squirrels Heath, Romford. See advertisement in this issue for further particulars.

NOVEMBER 29.—**Pickie.**—HOT SALT BATHS.—The Bangor (Co. Down) U.D.C. invite plans, etc., for hot sea-water baths at Pickie. For further particulars see advertisement in issue of August 20.

NOVEMBER 1, 1911.—**City of St. Petersburg.**—MONUMENT TO ALEXANDER II.—Particulars in our issue of August 13, 1910.

* NO DATE.—**Manchester.**—LAYING-OUT ESTATE.—The Manchester Corporation invite designs for laying-out their Blackley Estate. Three premiums are offered. See advertisement in this issue for further particulars.

* NO DATE.—**Ruislip-Northwood.**—TOWN PLANNING.—The Directors of Garden Estates, Ltd., invite designs for a town plan of estates of King's College, Cambridge, situated in the urban district of Ruislip and Northwood, Middlesex. See advertisement in this issue for further particulars.

Contracts.

BUILDING.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

AUGUST 27.—**Darlington.**—REPAIRS, ETC.—Repairs, alterations, and additions to Brettanby Manor House and other buildings, about seven miles from Darlington. Names, stating for which branches of work quantities are required, to Messrs. J. P. Pritchett & Son, architects, etc., 24, High-row, Darlington.

AUGUST 27.—**Treherbert.**—ADDITIONS TO CO-OPERATIVE BRANCH.—Alterations and additions at the Treherbert Branch of the Ton Co-operative Society, Ltd. Plans, etc., may be seen, and quantities obtained, on deposit of 2*l.* 2s., at the office of Mr. W. D. Morgan, M.S.A., architect, 194, Ystrad-road, Pentre, Rhondda, on or before the 27th inst.

AUGUST 29.—**Boston.**—ALTERATIONS TO POLICE-CELLS.—The Holland C.C. invite tenders for alterations to the police-cells at the Sessions House, Boston. Specifications may be obtained, and plans seen, at the office of Mr. E. J. A. Christie, County Surveyor, Market-place, Boston.

AUGUST 29.—**Sevenoaks.**—MORTUARY.—The U.D.C. invite tenders for the erection of a mortuary at the Council's depot, Gordon-road, Sevenoaks. Plans, etc., may be seen on application to the Surveyor of the Council, Mr. Samuel Towlson, A.M.Inst.C.E., at the Council Offices, Argyle-road, Sevenoaks, on deposit of 2*l.* 2s.

AUGUST 30.—**Boston, Lincs.**—ALTERATIONS, ETC., TERRITORIAL BARRACKS.—The Lincolnshire Territorial Association invite tenders for certain alterations and additions to the barracks at Boston. Specification, etc., may be obtained, upon a deposit of 2*l.* 2s., at the offices of Messrs. Scorer & Gamble, architects and surveyors, Bank-street-chambers, Lincoln.

AUGUST 30.—**South Brent.**—CHURCH HALL.—Erection of a hall, for the Church Hall Committee. Plans can be seen, and bills of quantities obtained, at the office of Mr. R. Hansford Worth, 42, George-street, Plymouth.

AUGUST 30.—**Troedyrhiw.**—BUSINESS AND DWELLING PREMISES.—Erection of business and dwelling premises at Troedyrhiw, near Merthyr, for the executors of the late Mr. William Harris. Plans, etc., may be seen, and quantities obtained, on payment of 1*l.* 1s., at the offices of Messrs. Johnson & Richards, architects, Merthyr Tydfil.

AUGUST 31.—**Hull.**—LODGE.—The Parks and Burial Committee invite tenders for the erection of a horseman's lodge in the Pickering Park. Drawings, etc., may be seen, and quantities obtained, upon a deposit of 2*l.* 2s., at the office of Mr. Joseph H. Hirst, City Architect, Town Hall, Hull.

AUGUST 31.—**Hull.**—PARK-KEEPER'S LODGE.—The Parks and Burial Committee invite tenders for the erection of a park-keeper's lodge in the Pickering Park. Drawings, etc., may be seen, and quantities obtained, upon a deposit of 2*l.* 2s., at the office of Mr. Joseph H. Hirst, City Architect, Town Hall, Hull.

AUGUST 31.—**Leeds.**—ALTERATIONS AND FURNISHING.—The Property Committee invite tenders for alterations and furnishing at the offices of the City Treasurer's and City Engineer's departments, Municipal-buildings, Leeds. Conditions, etc., may be seen, and quantities obtained, at the office of Mr. W. T. Lancashire, City Engineer, Municipal-buildings, Leeds.

SEPTEMBER 2.—**Duffryn Rhondda.**—HOUSES.—Erection of from forty to fifty houses, for Messrs. the Duffryn Rhondda Building Club. Plans, etc., can be seen at the office of Mr. Frank B. Smith, C.E., architect and surveyor, Port Talbot.

SEPTEMBER 3.—**Altrincham.**—ADDITIONS.—Additions to the Altrincham Conservative Club. Quantities can be obtained, and drawings seen, at the offices of the architect, Mr. Thomas Blagburn, 20 and 21, Station-buildings, Altrincham, upon payment of 1*l.* 1s.

SEPTEMBER 3.—**Nansavallan.**—PAIR OF COTTAGES.—Erection of a pair of cottages at Nansavallan, in the Parish of Kea, in the occupation of Mr. Ernest Hawkey. Plans, etc., can be seen at the Farmhouse at Nansavallan.

* SEPTEMBER 3.—**Royal Leamington Spa.**—GREENHOUSE.—The Corporation of Royal Leamington Spa invite tenders for a greenhouse in Jephson Gardens. See advertisement in this issue for further particulars.

SEPTEMBER 5-15.—**Frithville.**—ALTERATIONS TO COUNCIL SCHOOL.—Lindsey C.C. Education Committee invite tenders for alterations to the Council school at Frithville. Quantities, etc., may be had on application to Messrs. Scorer & Gamble, architects, Bank-street-chambers, Lincoln (where the drawings, etc., may be inspected), on payment of 1*l.* 1s., on or before September 5.

SEPTEMBER 5-15.—**Legsby.**—ELEMENTARY SCHOOL.—Lindsey C.C. Education Committee invite tenders for the erection of a new Council elementary school at Legsby. Quantities, etc., may be had on application to Messrs. Scorer & Gamble, architects, Bank-street-chambers, Lincoln (where plans, etc., may be seen), on payment of 1*l.* 1s., not later than September 5.

SEPTEMBER 5.—**Merthyr Tydfil.**—COUNCIL SCHOOLS.—The Education Committee invite tenders for the erection of an infants' school at Darren View, and a boys' school and a girls' school adjoining Thomastown Park. Particulars can be obtained from the Deputy Surveyor, Town Hall, Merthyr Tydfil, on deposit of 2*l.* 2s.

* SEPTEMBER 6.—**Bury (Lancs).**—ENLARGEMENT OF POST-OFFICE.—The Commissioners of H.M. Works and Public Buildings invite tenders for enlargement of Bury (Lancs) Post-office. See advertisement in this issue for further particulars.

* SEPTEMBER 6.—**London, E.**—NURSES' CLASSROOM.—The Managers of the Poplar and Stepney Sick Asylum District invite tenders for nurses' classroom and addition to drug stores, etc., at District Sick Asylum, Devons-road, Bromley, E. See advertisement in this issue for further particulars.

SEPTEMBER 6.—**Ynys-y-gored, Aberfan.**—HOUSES, ROADS, ETC.—Erection of forty-five houses, together with the construction of roads, sewers, surface-water drains, etc., for the Grove Building Club. Plans, etc., may be seen at the offices of Mr. T. Edmund Rees, architect and surveyor, The Walk, Merthyr Tydfil.

* SEPTEMBER 7.—**Andover.**—POST-OFFICE.—The Commissioners of H.M. Works and Public Buildings invite tenders for new Post-office at Tidworth Camp, Andover. See advertisement in this issue for further particulars.

SEPTEMBER 9.—**Handsworth.**—SCHOOL ALTERATIONS.—The west Riding Education Committee invite whole or separate tenders for alterations to cloak-room at the Woodhouse Council School. Plans may be seen, and specifications, etc., obtained, on application to the Education Architect, County Hall, Wakefield. Plans may also be seen at the school.

SEPTEMBER 9.—**Penygroes, Carmarthenshire.**—PUBLIC HALL.—For erecting a public hall. Plans, etc., may be seen at the office of the architect, Mr. W. D. Jenkins, F.R.I.B.A., Llandilo.

SEPTEMBER 10.—**Rookhope.**—BUSINESS PREMISES.—The Committee of the Stanhope and Weardale Industrial and Provident Society, Ltd., invite tenders for the whole or separate works to be done in the erection of proposed new branch business premises at Rookhope. Plans, etc., may be seen, and forms obtained, upon application at the Central Office, Front-street, Stanhope; or to the architect, 3, Westview, Blackhill.

SEPTEMBER 12.—**Cwmtillery.**—HOUSES AND ROADS.—The Abertillery U.D.C. invite tenders for the erection of thirty-one houses, and the construction of the necessary roads. Plans, etc., may be seen on application to Mr. Lionel D. Lewis, the Council's Engineer, at his office, King-street, Abertillery, and specifications may be obtained on deposit of 1*l.* 1s., by cheque, made payable to the Council.

* SEPTEMBER 14.—**Market Harborough.**—POLICE COURT.—The Leicestershire C.C. invite tenders for new police court, superintendent's house, stables, and alterations to existing buildings. See advertisement in this issue for further particulars.

* SEPTEMBER 17.—**London, S.E.**—ADDITIONS.—The Penge U.D.C. invite tenders for additions and alterations to their offices at the Town Hall, Anerley-road, S.E. See advertisement in this issue for further particulars.

SEPTEMBER 19.—**Cosham.**—ALTERATIONS AND NEW HEATING APPARATUS AT POLICE-STATION.—Alterations and new heating apparatus to cells at Cosham Police-station. Conditions may be seen, and specification obtained, on payment of 1*l.* 1s., at the offices of Mr. W. J. Taylor, County Surveyor, The Castle, Winchester, on and after the 29th inst. Deposits must be made by cheque, payable to the Hants C.C., and crossed "& Co."

* SEPTEMBER 19—**London, E.**—SCHOOL.—The West Ham Education Committee invite tenders for school at Gainsborough-road, Canning Town, E. See advertisement in this issue for further particulars.

* SEPTEMBER 24.—**Newport.**—PUMPING AND POWER STATION.—The Alexandra (Newport and South Wales) Docks and Railway Company invite tenders for foundations and buildings for pumping and power station at Newport. See advertisement in this issue for further particulars.

NO DATE.—**Brynmawr.**—ALTERATIONS, ETC.—Alterations, additions, and renovations to properties at Boundary and Worcester streets, Brynmawr, for Mr. T. Tranter. Plans, etc., and further information obtainable at office of Mr. Hy. Waters, M.S.A., architect and surveyor, Ebbw Vale.

NO DATE.—**Corlust, Co. Armagh.**—VILLA RESIDENCE.—The erection of a villa residence at "Pillar Hill," Corlust (near Tandragee), Co. Armagh, for the executors of the late Mr. James M'Keown. Plans, etc., may be obtained at the office of Mr. Charles MacAlister, architect, Whitehall-buildings, Belfast.

NO DATE.—**Polseath, near Wadebridge.**—BUNGALOW.—Erection of a bungalow.—Plans and specification may be seen by appointment at 2, Montpelier-terrace, Torpoint. Mr. Arthur Gilbert, architect.

ENGINEERING, IRON, AND STEEL.

AUGUST 30.—**Horsmonden.**—BRIDGE WIDENING.—The Kent Bridges and Roads Committee invite tenders for the widening of Horsmonden Bridge. Quantities, etc., may be obtained at office of Mr. Frederick W. Ruck, County Architect, 86, Week-street, Maidstone, where specification may also be inspected.

AUGUST 30.—**Sutton-in-Ashfield.**—GASWORKS EXTENSIONS.—The U.D.C. invite tenders for the supply and erection at the gasworks sidings, Sutton-in-Ashfield, of a self-contained railway weighbridge and two railway turntables. Mr. John D. Fiddler, Clerk to the Council, Council Offices, Sutton-in-Ashfield, Notts.

ENGINEERING, etc.—*continued.*

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

AUGUST 30.—**Swailsford.**—BRIDGES.—Chipping Norton R.D.C. invite tenders for the erection of the two Swailsford bridges, situate at the boundary of the parishes of Cornwell and Churchill. Plans, etc., can be seen, by appointment only, with Mr. R. Entwistle, Surveyor to the Council, Chadlbury.

AUGUST 31.—**Burton-upon-Trent.**—GAS-ENGINE.—The Guardians invite tenders for the provision and erection of three-throw pumps, Crossley gas-engine, shafting, and gearing at the Union Workhouse, in accordance with the plans, etc., which may be seen at the office of their Architect, Mr. Thomas Jenkins, of Arcade-buildings, Station-street, Burton-on-Trent.

AUGUST 31.—**India.**—GIRDER BRIDGES.—The East Indian Railway Company invite tenders for the supply and delivery of girder bridges (6-ft., 12-ft., 20-ft., 30-ft., 40-ft., and 60-ft. spans), as per specification, to be seen at the company's offices. For each specification a fee of 1*l.* 1s. is charged (not returnable). Mr. C. W. Young, Secretary, Nicholas-lane, London, E.C.

SEPTEMBER 2.—**Burma.**—GALVANISED CORRUGATED SHEETS AND RIDGE CAPPING.—The Board of Directors of the Burma Railways Company, Ltd., invite tenders for the supply of 137 tons of galvanised corrugated sheets, and 350 lengths of ridge capping (2,100 ft.). For each copy of the specification a fee of 1*l.* will be charged, which will not be returned. Mr. W. Home, Managing Director, 199, Gresham-house, Old Broad-street, E.C.

SEPTEMBER 2.—**Rhondda.**—GASWORKS.—The Rhondda U.D.C. invite tenders for:—Contract No. 50, one gas-station meter at Porth gasworks; contract No. 51, building one bed and setting with eight inclined retorts on the tubular regenerator system in existing house at Porth gasworks; contract No. 52, boundary wall and fencing around the Tonypandy gasholder station and Blaenclydach pumping station. Specification, etc., contract No. 50 can be obtained, whilst the plans, etc., for contracts Nos. 51 and 52 much be inspected at the office of the Engineer and Manager, Mr. Octavius Thomas, Gas and Water Offices, Pentre, Rhondda, upon payment of 1*l.* 1s.

SEPTEMBER 5.—**Flixton.**—WROUGHT-IRON FENCING.—The Flixton P.C. invite tenders for the supply and erection of wrought-iron fencing and gates at their new Recreation Ground. Plans, etc., may be seen, and quantities obtained, on application to Mr. A. H. Mountain A.M.Inst.C.E., Engineer and Surveyor, 16 John Dalton-street, Manchester.

SEPTEMBER 6.—**Manchester.**—TRAMWAY RAILS.—The Tramways Committee invite tenders for the supply of steel girder tramway rails. Specifications and forms may be obtained on application to Mr. J. M. M'Elroy, General Manager, Corporation Tramways, 55, Piccadilly, Manchester, on deposit of 1*l.* 1s.

SEPTEMBER 12.—**Salford.**—STEAM-FEED PUMP.—The Corporation invite tenders for the supply and delivery at their electricity works, Frederick-road, Pendleton, of a vertical steam-feed pump. Particulars may be had from the Borough Electrical Engineer, Electricity Works, Frederick-road, Pendleton, on receipt of a deposit of 1*l.* 1s. Extra copies 5s. each, which is not returnable.

MISCELLANEOUS.

AUGUST 29.—**Dublin.**—SCHOOL FURNISHING.—Tenders are invited by the Technical Education Committee for the following articles, in accordance with samples, which may be inspected in the Museum-room of the new schools at Bolton-street:—(A) 300 chairs; (B) 400 folding desks of pitch-pine; (C) forty tables, material to be pitch-pine, unvarnished. Every article to be made in Ireland, and by trades union labour throughout. Mr. Louis Ely O'Carroll, Secretary, City of Dublin Technical Education Committee, Offices, Lower Kevin-street, Dublin.

AUGUST 30.—**Tredegar.**—FURNISHING CHILDREN'S HOME.—The Bedwellty Guardians invite tenders for the furnishing of a new children's home in Tredegar. Schedules of the articles required may be obtained at the office of Mr. H. J. C. Shepard, Clerk, at the Workhouse, Tredegar, either by personal application, or by forwarding a stamped addressed foolscap envelope.

SEPTEMBER 1.—**Devonport.**—PLUMBER'S WORK.—The Guardians invite tenders for the execution during the half-year ending Lady Day of plumber's work. Forms of tender may be obtained from the Master of the Workhouse.

SEPTEMBER 3.—**Bedford.**—CARTING.—The R.D.C. invite tenders for the cartage of road material upon the district roads. Tenders to the District Surveyor, Mr. John T. Sanders, Carlton.

SEPTEMBER 3.—**Taunton.**—HAULING AND TEAM LABOUR.—The T.C. invite tenders for hauling and team labour. Specifications to be seen at the office of Mr. D. Edwards, A.M.Inst.C.E., Borough Surveyor, Municipal-buildings, Taunton.

SEPTEMBER 6.—**Boston.**—CLEANING-OUT SEWER.—Tenders are invited for cleaning-out the greater Five Towns drain. Sections, etc., can be seen on application to Mr. F. Bett, Surveyor, Kirton.

SEPTEMBER 6.—**Chipping Wycombe.**—REMOVAL OF BUILDINGS, ETC.—The Corporation invites tenders for the taking down and removal of the buildings and machinery at Beech Mill, Wycombe Marsh. The specification may be obtained at the office of Mr. T. J. Rushbrooke, Borough Surveyor, Easton-street.

SEPTEMBER 6.—**Deptford.**—DEMOLITION.—The B.C. invite tenders for the demolition of premises, Nos. 140, 142, and 144, Lewisham High-road, in accordance with the terms and conditions, to be obtained from the Borough Surveyor, at the Town Hall, New Cross-road, S.E., during office hours.

SEPTEMBER 6.—**Margate.**—BALLAST.—Tenders are invited for about 3,500 cubic yds. of ballast. Further particulars can be obtained on application to Mr. E. A. Borg, Borough Surveyor, 13, Grosvenor-place, Margate.

SEPTEMBER 6.—**Rochester.**—DEMOLITION OF BUILDINGS.—The Corporation invite tenders for the pulling down and removal of certain houses at Corporation-street and Allen's-square. Full particulars and forms of tender can be obtained of Mr. William Banks, A.M.Inst.C.E., City Surveyor, Guildhall, Rochester.

✱ SEPTEMBER 7.—**London.**—IRON BUILDINGS.—The London C.C. invite tenders for removing and re-erecting iron buildings at Earlsfield, S.W. See advertisement in this issue for further particulars.

SEPTEMBER 7.—**Sandridge.**—COLLECTION OF HOUSE REFUSE.—The St. Albans R.D.C. invite tenders for the collection of house refuse from the houses in the Bernards Heath Ward of the Parish of Sandridge. Further particulars can be obtained from the Sanitary Inspector, Mr. R. S. Davey, 169, Hatfield-road, St. Albans.

SEPTEMBER 15.—**Prescot.**—FURNISHING HOSPITAL.—The Guardians invite tenders for furnishing, etc., of new male mental hospital. Forms to be obtained at office of Mr. F. Mann, Union Clerk, Union Offices, Whiston, Preston.

SEPTEMBER 16.—**Great Waltham.**—SCAVENGING.—The R.D.C. of Chelmsford invite tenders for the emptying of the pail-closets in a portion of the parish of Great Waltham. Particulars may be obtained from Mr. William Edser, Sanitary Inspector, Bank-chambers, Chelmsford.

SEPTEMBER 26.—**London.**—CREOSOTING, ETC., TELEGRAPH POLES.—The Postmaster-General invites tenders for creosoting, etc., telegraph poles. Forms of tender, containing all particulars, may be obtained on application to Mr. G. Morgan, Controller of Stores, Stores Department, G.P.O., 17-19, Bedford-street, London, W.C.

SEPTEMBER 26.—**London.**—TELEGRAPH POLES.—The Postmaster-General invites tenders for the supply of Swedish, Norwegian, Finland, or Russian red fir telegraph poles, to be delivered at any one or more of certain ports as may be directed. Forms of tender, containing all particulars, may be obtained on application to Mr. G. Morgan, Controller of Stores, Stores Department, G.P.O., 17-19, Bedford-street, London, W.C.

✱ NO DATE.—**London, N.W.**—PALE FENCING.—Tenders invited for pale fencing in cricket grounds at Brondesbury, N.W. See advertisement in this issue for further particulars.

PAINTING, etc.

AUGUST 29.—**Hove.**—COLOURING AND PAINTING.—The Corporation invite tenders for colouring and painting portions of the interior of the Town Hall. Further particulars may be obtained at the Borough Surveyor's Office.

AUGUST 30.—**Dungannon.**—CLEANING, PAINTING, AND REPAIRS.—The Select Vestry of Drumglass Parish Church, Dungannon, invite tenders for various works of painting, repairs, and cleaning. Mr. J. M. Wilson, Secretary, Select Vestry, Dungannon.

AUGUST 31.—**Cwmyglo, R.S.O.**—PAINTING.—For painting Ebenezer Chapel and House. Further particulars can be had from Mr. E. R. Hughes, 1, Caradog-place, Ebenezer, Cwmyglo, R.S.O.

SEPTEMBER 1.—**Hull.**—PAINTING.—The Corporation invite tenders for painting the roofs of certain markets. Forms of tender and other particulars may be obtained at the office of Mr. A. E. White, M.Inst.C.E., City Engineer, Town Hall. Hull.

SEPTEMBER 5.—**Erdington, Birmingham.**—PAINTING.—The Aston Guardians invite tenders for exterior painting at the Workhouse and the Cottage Homes, Erdington. Specifications can be seen, and forms of tender obtained, on application to the Master at the Workhouse.

SEPTEMBER 5.—**Gormanston and Laytown.**—PAINTING.—The Directors of the Great Northern Railway Company (Ireland) invite tenders for the painting of the bridge over the River Delvin at their Gormanston Station, and of the bridge over the River Nanny at their Laytown Station. Particulars, etc., may be had at the offices of Mr. T. Morrison, Secretary, Secretary's Office, Amiens-street Terminus, Dublin, or at his office at Belfast.

✱ SEPTEMBER 8.—**London, N.**—PAINTING, ETC.—The Guardians of St. Mary, Islington, invite tenders for painting, whitewashing, etc., at Infirmary, Highgate-hill, N. See advertisement in this issue for further particulars.

SEPTEMBER 14.—**Glemsford.**—PAINTING.—The U.D.C. invite tenders for painting the water tank, etc. Specifications may be had on application to Mr. H. L. Taylor, Surveyor, Glemsford, Suffolk.

NO DATE.—**Guildford.**—REPARATIONS, PAINTING, ETC.—The Committee of the Guildford Institute invite tenders from local firms for carrying out certain reparations, painting, etc., at the Institute in Ward-street. Specification may be obtained on application to Messrs. Clemence & Moon, surveyors, Bank House, Guildford.

NO DATE.—**Leeds.**—PAINTING SHOPS.—For painting four shops, Meadow-road. Apply to Mr. Brook, pork butcher, Meadow-road, Leeds.

ROADS, SANITARY, AND WATER WORKS.

AUGUST 29.—**Haddington.**—NEW ROAD.—Reconstructing the Edinburgh-road with bitumenous bound macadam on existing and reformed foundation, etc. Schedules of quantities, etc., may be had from the Town Clerk, Haddington.

AUGUST 29.—**Plymouth.**—MAKING-UP.—The Corporation invite tenders for making-up and completing:—(1) Grenville-road-lane North; (2) Glendower-road-lane South, No. 1; (3) Glenpark-avenue, section 1. Plans, etc., may be seen, and quantities obtained, at the office of Mr. James Paton, Borough Engineer, Municipal Offices, Plymouth.

AUGUST 31.—**Felling.**—FOOTPATH.—The U.D.C. invite tenders for the formation of kerbed and concrete footpath and channelling, Elliot-street. Plan, etc., may be seen at the office of the Surveyor any morning.

AUGUST 31.—**Lanark.**—SEWERAGE AND SEWAGE-DISPOSAL WORKS.—The District Committee of the Lower Ward of the County of Lanark invite tenders for (1) providing fireclay pipe sewers, together with manholes, storm overflows, etc.; and (2) the construction of sewage tanks and percolating filter-beds and other accessory works at Bridgend. Drawings may be seen at the office of Messrs. Warren & Stuart, civil engineers, 94, Hope-street, Glasgow, where copies of the specification, etc., may be obtained on payment of 1*l.* 1s.

AUGUST 31.—**Plymouth.**—RECONSTRUCTION OF DRAINS.—The Corporation invite tenders for the reconstruction of the common drains in the rear of Nos. 48 to 55, and Nos. 57 to 61, Hill Park-crescent. Plans, etc., may be seen, and quantities obtained, at the office of Mr. James Paton, Borough Engineer and Surveyor, Municipal Offices, Plymouth.

SEPTEMBER 3.—**Taunton.**—PRIVATE STREET WORKS.—The T.C. invite tenders for the carrying out of the necessary works in Winchester-street (North). Plans, etc., may be seen, and form obtained, on application at the office of Mr. D. Edwards, A.M.Inst.C.E., Borough Surveyor, Municipal-buildings, Taunton.

SEPTEMBER 5.—**Barnsley.**—SEWAGE TANKS AND BACTERIAL FILTER.—The T.C. invite tenders for the construction of sewage tanks, and a bacterial filter, and other works at Cliffe Wood and at the Lund Fields, near Barnsley. Drawings, etc., can be seen, and quantities obtained (on payment of 3*l.* 3s. to Mr. John F. Burn, Borough Accountant, Barnsley), on application to Mr. J. Henry Taylor, M.Inst.C.E., engineer for the works, Manor House Offices, Barnsley.

SEPTEMBER 5.—**Dawlish.**—SEWER.—The U.D.C. invite tenders for the laying of stoneware pipe and other incidental work at Holcombe, in the parish of Dawlish. Drawings, etc., may be seen at the office of the Engineer and Surveyor, Mr S. F. C. Churchward, Dawlish.

SEPTEMBER 5.—**Glasgow.**—PIPE SEWER.—The Corporation invite offers for the construction of a 15-in. pipe sewer in Cumbernauld-road, from Finlay-drive to Onslow-drive. Specifications, etc., may be had on application at the Office of Public Works, 64, Cochrane-street.

SEPTEMBER 5.—**Handsworth.**—SEWERS.—The U.D.C. invite tenders for the laying of sewers, together with manholes, etc. Conditions, etc., may be seen, and quantities, etc., obtained, on application to Mr. H. Richardson, Assoc.M.Inst.C.E., Engineer and Surveyor to the Council, Council House, Handsworth.

✱ SEPTEMBER 5.—**Hendon.**—OUTFALL SEWER, ETC.—The Hendon U.D.C. invite tenders for outfall sewer, etc., also kerbing, channelling, and paving works. See advertisement in this issue for further particulars.

SEPTEMBER 5.—**Otley.**—MAKING-UP.—The U.D.C. invite tenders for the making-up of Garnett-street, Back Garnett-street, etc. Plans, etc., may be seen, and quantities, etc., may be obtained, at the office of the Engineer and Surveyor to the Council, Mr. C. F. Hodgson, on deposit of 2*l.* 2s.

SEPTEMBER 5.—**Sandhutton.**—SANITARY PIPES AND INSPECTION CHAMBERS.—Thirsk R.D.C. invite tenders for laying sanitary pipes in the parish of Sandhutton, also the building of two inspection chambers. Specifications and further particulars may be had from Mr. Thomas Barnett, Inspector of Nuisances, Sowerby, Thirsk.

SEPTEMBER 6.—**Frinton-on-Sea.**—PRIVATE STREET WORKS.—The U.D.C. invite tenders for forming and making-up Raglan-road and the School-road. Forms and quantities may be obtained, and the drawings seen, on application to Mr. E. M. Bate, the Surveyor to the Council, and on deposit of 2*l.* 2s.

SEPTEMBER 6.—**Watford.**—MAKING-UP.—The U.D.C. invite tenders for the making-up of Sandringham-road, Buckingham-road, etc. Plans, etc., may be seen on application at the Council Offices, 14, High-street, Watford, and schedule of quantities may be obtained from Mr. D. Waterhouse, Engineer and Surveyor to the Council, on receipt of a deposit cheque of 1*l.*, payable to the Watford U.D.C.

SEPTEMBER 7.—**Kingston-on-Thames.**—ROAD WORKS AND LIGHTING.—The Corporation invite tenders for levelling, metalling, sewering, etc., and lighting part of Gloucester-road. Plans and specification can be seen at the office of Mr. R. Hampton Clucas, Borough Surveyor, Municipal Offices, where forms of tender can be obtained.

SEPTEMBER 7.—**Leatherhead.**—TAR-MACADAM.—The U.D.C. invite tenders for supplying and laying 2,000 super. yds. of tar-paving in roadway. Specification, etc., can be obtained at the office of Mr. J. E. Smales, Surveyor, Council Offices, Leatherhead.

SEPTEMBER 8.—**Penrith.**—SEWERAGE WORKS.—The U.D.C. invite tenders for the construction of sewers in certain roads and streets (contract No. 8). General conditions, etc., may be obtained, and drawings inspected, at the Town Hall, upon receipt of a deposit of 2*l.* 2s. Full particulars may be obtained from the engineers, Messrs. Brierley, Holt, & Co., of Blackburn and Blackpool, or from the resident engineer, Mr. J. J. Knewstubb, Town Hall, Penrith.

SEPTEMBER 9.—**Finchley.**—PRIVATE STREET WORKS.—The U.D.C. invite tenders for the making-up of Arden-road, Brighton-road, Chamberlain-road, etc. Plans, etc., may be seen at the offices of the Council's Engineer and Surveyor, Mr. C. J. Jenkin, A.M.Inst.C.E., Council Offices, Church End, Finchley, N., and copies of schedules, etc., will be supplied on deposit of 2*l.* 2s.

SEPTEMBER 9.—**Finchley.**—SOIL SEWERS.—The U.D.C. invite tenders for the construction of soil sewers between Great North-road and Woodgrange-avenue. Plans, etc., may be seen at the offices of the Council's Engineer and Surveyor, Mr. C. J. Jenkin, A.M.Inst.C.E., Council Offices, Church End, Finchley, N., and copies of schedules, etc., will be supplied on deposit of 2*l.* 2s.

SEPTEMBER 9.—**Level of Walland Marsh and Elderton's Innings.**—SEWER WORKS.—The Commissioners of Sewers invite tenders for the making-out, widening, and deepening of about 1,200 rods of Jury's Gut main sewer, from Kent Pen Sluice, near Jurys Gap, in the parish of Broomhill, Sussex, to Horses Bones Bridge, near Lydd, Kent. Full particulars of the works, and forms of tender, can be obtained from Mr. E. F. Elliott, the Level's Engineer, Scots Float, Playden, near Rye, Sussex.

ROADS, etc.—*continued.*

SEPTEMBER 10.—**Bedwellty.**—SEWERS.—The U.D.C. invite tenders for the construction of subsidiary sewers in the Sirhowy Valley portion of their district. Plans may be seen, and quantities, etc., obtained, on application to the Council's Surveyor, Mr. J. H. Lewis, Assoc.M.Inst.C.E., Blackwood, Mon., upon payment of 2*l.* 2s.

SEPTEMBER 12.—**Southampton.**—TAR-PAVING FOOTWAYS, ETC. (two contracts).—A drawing, with specifications, etc., may be seen, and forms, etc., obtained, at the Borough Engineer's office, upon production of the Borough Treasurer's receipt for a deposit of 1*l.* 1s. in respect of each contract.

SEPTEMBER 17.—**Bath.**—SEWERAGE AND SEWAGE DISPOSAL.—The Corporation invite tenders for the construction of brick culverts, together with other pipe sewers, manholes, etc., required for the replacement of the Marlborough-buildings and Julian-road old stone internal sewers. Plans may be seen, and quantities obtained, at the office of the Engineer, Mr. W. H. Radford, C.E., Albion-chambers, Nottingham, on deposit of 2*l.* 2s. The plans will also be on view at the City Surveyor's Office, Guildhall, Bath, on and after September 3 next.

SEPTEMBER 22.—**Croydon.**—KERBING AND PAVING.—The R.D.C. invite tenders for kerbing and paving in the parish of Mitcham. Forms, etc., may be obtained from Mr. E. J. Gowen, Clerk to the Council, Katharine-street, Croydon.

STONES, MATERIAL, AND STORES.

AUGUST 29.—**Lymington.**—GRANITE, ETC., AND STEAM ROLLING.—The T.C. invite tenders for the supply of about 360 tons of granite or basalt, broken to 2-in. gauge, and about 36 tons of granite chippings, broken to ¾-in gauge. Samples to be forwarded to Mr. F. Hill Parr, Borough Surveyor, and tenders (without forms), endorsed "Tender for Granite," to be sent to Mr. J. Davis Rawlins, Town Clerk, Town Clerk's Office, Lymington, Hants. Tenders for steam rolling and scarifying (particulars of which can be obtained upon application to the Borough Surveyor) are also invited.

AUGUST 30.—**India.**—TOOLS AND STORES.—The Directors of the Bombay, Baroda, and Central India Railway invite tenders for the supply of miscellaneous tools and stores. Forms, with specification, can be obtained on payment of 21s. each (which will not be returned), at the offices of Mr. C. Crommelin, Secretary, Gloucester-house, 2, 3, and 4, Bishopsgate-street Without, London, E.C.

AUGUST 30.—**Sheppey.**—RAGSTONE AND PIT FLINTS.—The R.D.C. invite tenders for the supply of blue ragstone and pit flints. Forms of tender can be obtained on application to Mr. John Copland, Clerk, Sheerness.

AUGUST 31.—**Belfast.**—KERBSTONES.—The Works Committee invite tenders for the supply of 3,000 lin. yds. of granite kerbstones. Forms of tender and particulars can be obtained at the Superintendent of Works' Office, City Hall.

SEPTEMBER 1.—**Hebburn.**—STORES.—The U.D.C. invite tenders for the supply of stores. Forms of tender may be had from Mr. Thomas Stuart, Clerk to the Council, 2, Coquet-street, Hebburn.

* SEPTEMBER 1.—**London, N.E.**—STOVES, ETC.—The West Ham Union invite tenders for supply of stoves, kitcheners, etc., for receiving homes at Aldersbrook-road, Wanstead, N.E. See advertisement in this issue for further particulars.

SEPTEMBER 4.—**Bromley.**—MATERIALS FOR ROADS; TEAM LABOUR.—The R.D.C. invite tenders for the supply of road materials, carting of materials, and team labour in certain parishes, Forms of tender may be obtained at the offices of Mr. Edward Haslehurst, Clerk to the Council, Council Offices, Park House, Bromley, Kent.

SEPTEMBER 6.—**Rochester.**—MATERIALS.—The Corporation invite tenders for the supply of materials. Specifications, etc., can be obtained on application to Mr. William Banks, A.M.Inst.C.E., City Surveyor, Guildhall, Rochester.

SEPTEMBER 7.—**Leatherhead.**—MATERIALS AND LABOUR.—The U.D.C. invite tenders for the supply of materials and labour, and also for granite chippings. Specification, etc., can be obtained from Mr. J. E. Smales, Surveyor, Council Offices, Leatherhead.

SEPTEMBER 7.—**London.**—STORES.—The Guardians of the St. George's Union invite tenders for the supply of stores. Forms of tender can be obtained upon personal application, or by forwarding to me a stamped, large size envelope at the offices of Mr. Thomas Worlock, Clerk to the Guardians, Guardians' Offices, Princes-row, Buckingham Palace-road, S.W.

SEPTEMBER 7.—**West Riding.**—MATERIALS.—Tenders are invited for supplying the West Riding Lunatic Asylums at Menston (near Leeds), Storthes Hall, Kirkburton (near Huddersfield), Wadsley Bridge (near Sheffield), and Wakefield with surveyor's materials, lead, tin, iron, etc. Forms of tender and other particulars may be obtained on application to the Clerk to Asylums Committee, Room No. 30, County Hall, Wakefield.

SEPTEMBER 8.—**Gosport and Alverstoke.**—STORES.—The U.D.C. invite tenders for the supply of materials, etc. Specifications, form of tender, etc., may be obtained from the Surveyor to the Council, Town Hall, Gosport, and will be forwarded on receipt of stamped addressed foolscap envelope.

SEPTEMBER 9.—**Whalley.**—GRANITE CUBES.—Lancashire C.C. Main Roads and Bridges Committee invite tenders for the supply of 700 tons of 4-in. granite cubes, delivered at Whalley Station. Tenders, endorsed "Granite Cubes," must be delivered, together with a sample of material, to Mr. W. H. Schofield, County Surveyor, County Offices, Preston.

SEPTEMBER 10.—**Morpeth.**—STORES.—The Visiting Committee of the Northumberland County Asylum, Morpeth, invite tenders for the supply of ironmongery, timber, oils, and paints, etc. Forms of tender and other information may be obtained from the Clerk and Steward at the Asylum.

SEPTEMBER 12.—**London.**—STORES.—The Directors of the Powell Duffryn Steam Coal Company, Ltd., invite tenders for the supply of stores. Forms of tender and all particulars can be obtained on application to the Stores Manager, Aberaman Offices, near Aberdare.

SEPTEMBER 16.—**Hellingly.**—STORES.—The Visiting Committee of the East Sussex County Asylum, Hellingly, invite tenders for the supply of hardware, earthenware, and glass. Forms of tender, etc., may be obtained from the Clerk and Steward at the Asylum, Hellingly, on application, and by forwarding to him a stamped addressed envelope.

Public Appointment.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*MANUAL TRAINING INSTRUCTOR	Kent Education Committee...	120*l.* per annum	Sept. 9

Auction Sales.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*BUILDER'S STOCK, PLANT, MACHINERY, &c., CLAPHAM-ROAD, S.W.—On the Prems.	J. T. Skelding & Holland	Aug. 30
*BRICKMAKING PLANT, ETC., BARNET—On the Premises	Charles Sparrow & Son	Sept. 12
*BUILDING LAND, GARRATT-LANE, EARLSFIELD.—As the Mart	Matthew Miles & Sons	Sept. 15
*BUILDING MATERIALS, MILBANK, S.W.—On the Premises	Fuller, Horsey, Sons, & Cassell	Sept. 20

PATENTS—*Continued from page* 251.

17,662 of 1909.—Albert Geyer: Fireproof doors.

18,148 of 1909.—James Claude Wilson: Lavatory basins and fittings.

18,528 of 1909.—Philip Aylett: Construction of concrete arches.

20,612 of 1909.—Danzel John Jarvis: Appliance for operating on wood and analogous materials, particularly applicable for end-matching boards.

21,892 of 1909.—Frederick Alexander MacDonald and Charles Baudart: Reinforced concrete construction.

27,036 of 1909.—Parker Winder Achurch, Ltd., and George Achurch: Holders for sliding window sashes.

27,160 of 1909.—Alfred Edwin Pusey: Device for use in connexion with wood screws.

28,107 of 1909.—John Hutton: Intercepting traps for drains.

29,191 of 1909.—Charles Sudre: Apparatus for cleaving slate blocks.

30,022 of 1909.—William Beasley and Ernest Wildman Burnett: Flooring cramps.

7,544 of 1910.—Alfred James Luke: Means of reinforcing concrete beams, piles, columns, struts, and floor slabs.

8,207 of 1910.—James Godfrey Wilson: Fire-resistant shutters or curtains.

8,353 of 1910.—George Harrison (Maschinenfabrik Sack Ges.): Machine for straightening metal plates and rods.

8,467 of 1910.—William Newman & Sons, Ltd., and George Frederick Newman: Appliances for opening and closing fanlights, rooflights, windows, and for analogous uses.

10,105 of 1910.—Charles Pryce: Panelling and marking apparatus for brick-making machines.

12,678 of 1910.—Philip Seymour Robinson: Rotary cutter heads or blocks for wood-planing machines.

15,826 of 1910.—Paul Ziron: Locks.

PUBLISHER'S NOTICES.

Nat. Tel., 6112 Gerrard. Telegrams, "The Builder, London."

THE INDEX (with TITLE-PAGE) for VOLUME XCVIII. (January to June, 1910) was given as a supplement with the issue of July 9.

CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each; also

READING CASES (Cloth), with Strings, price 9d. each.

THE NINETY-EIGHTH VOLUME of "The Builder" (bound), price Twelve Shillings and Sixpence.

SUBSCRIBERS' VOLUMES, on being sent to the Office, will be bound at a cost of 3s. 6d. each.

CHARGES FOR ADVERTISEMENTS.

COMPETITIONS, CONTRACTS, ALL NOTICES ISSUED BY CORPORATE BODIES, COUNTY AND OTHER COUNCILS, PROSPECTUSES OF PUBLIC COMPANIES, SALES BY TENDER, LEGAL ANNOUNCEMENTS, etc., etc.

Six lines or under ..... 6s. 0d.
Each additional line ..... 1s. 0d.

SITUATIONS VACANT, PARTNERSHIPS, APPRENTICESHIPS, TRADE AND GENERAL ADVERTISEMENTS.

Six lines (about fifty words) or under ..... 4s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

Terms for series of Trade advertisements, and for front page and other special positions, on application to the Publisher.

SITUATIONS WANTED (Single-handed—Labour only).

Four lines (about thirty words) or under ..... 2s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

PREPAYMENT IS ABSOLUTELY NECESSARY.

*** Stamps *must not* be sent; but all sums should be remitted by Postal Orders, payable to J. MORGAN, and addressed to the Publisher of "THE BUILDER," 4, Catherine Street, W.C.

Advertisements for the current week's issue are received up to ONE p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after TWELVE NOON on that day. Those intended for the Outside Wrapper should be in by TWELVE NOON on WEDNESDAY.

ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, etc., left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

ADVERTISERS in "THE BUILDER" may have *Replies addressed to the Office*, 4, Catherine Street, Strand, W.C., *free of charge*. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage. Unused stamps are returned to advertisers the week after publication.

N.B.—The Reply Boxes are not intended for trade lists, circulars, and the like; should these be received, they cannot (if noticed) be forwarded.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

READING CASES { NINEPENCE EACH. By post (carefully packed), 1s.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

Per 1000 Alongside, in River.

	£ s. d.
Best Stocks	1 10 0
Picked Stocks for Facings	2 10 0

Per 1000, Delivered at Railway Depôt.

	£ s. d.		£ s. d.
Flettons	1 7 0	Double Headers	13 7 6
Best Fareham Red	3 12 0	One Side and two Ends	17 7 6
Best Red Pressed Ruabon Facing	5 0 0	Two Sides and one End	18 7 6
Best Blue Pressed Staffordshire	3 15 0	Splays & Squints	15 17 6
Do. Bullnose	4 0 0	Best Dipped Salt Glzd. Str'tch'rs	10 17 6
Best Stourbridge Fire Bricks	3 14 0	Headers	10 7 6
GLAZED BRICKS.		Quoins, Bullnose, and Flats	14 7 6
Best White and Ivory Glazed Stretchers	10 17 6	D'ble Stretchers	16 7 6
Headers	10 7 6	Double Headers	13 7 6
Quoins, Bullnose, and Flats	14 7 6	One Side and two Ends	17 7 6
D'ble Stretchers	16 7 6	Two Sides and one End	18 7 6
		Splays & Squints	15 17 6

Second Quality White and Dipped Salt Glazed, £1 5s. per 1000 less than best.

	s. d.	
Thames and Pit Sand	6	6 per yard delivered.
Thames Ballast	5	0 ,, ,,
Best Portland Cement	28	0 per ton, ,,
Best Ground Blue Lias Lime	19	0 ,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 11s. 6d. per yard, delivered
Stourbridge Fireclay in sacks 27s. 0d. per ton at rly. dpt.

STONE.

Per Ft. Cube.

	s. d.
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½
Do. do. delivered on road waggons, Nine Elms Depôt	1 8½

1910.

arding to me
offices of Mr.
dians, Guar-
ham Palace.

MATERIALS. –
West Riding
eds), Storthes
l), Wadsley
d with sur-
c. Forms of
obtained on
Committee,

Averstoke.–
r the supply
n of tender,
eyor to the
be forwarded
p envelope.
CUBES.—Lan-
s Committee
tions of 4-in.
tation. Ten-
be delivered,
Mr. W. H.
ces, Preston.
The Visiting
nty Asylum,
oly of iron-
Forms of
be obtained
lum.
e Directors
mpany, Ltd.,
. Forms of
ed on appli-
man Offices,

The Visiting
sylum. Hel-
f hardware,
er, etc., may
ward at the
by forward-
pe.

Application to be in

Sept. 9

Date of Sale.

Aug. 30
Sept. 12
Sept. 15
Sept. 20

ERIALS.

possible, the
the lowest.
rices—a fact
make use of

	£ s. d
.....	1 10 0
.....	2 10 0

pôt.

	£ s. d.
lers	13 7 6
two	17 7 6
and	18 7 6
nts	15 17 6
Salt h'rs	10 17 6
.....	10 7 6
ose, ...	14 7 6
ers	16 7 6
lers	13 7 6
two	17 7 6
and	18 7 6
nts	15 17 6

azed, £1 5s.

d delivered.
"
"
"
ive of the

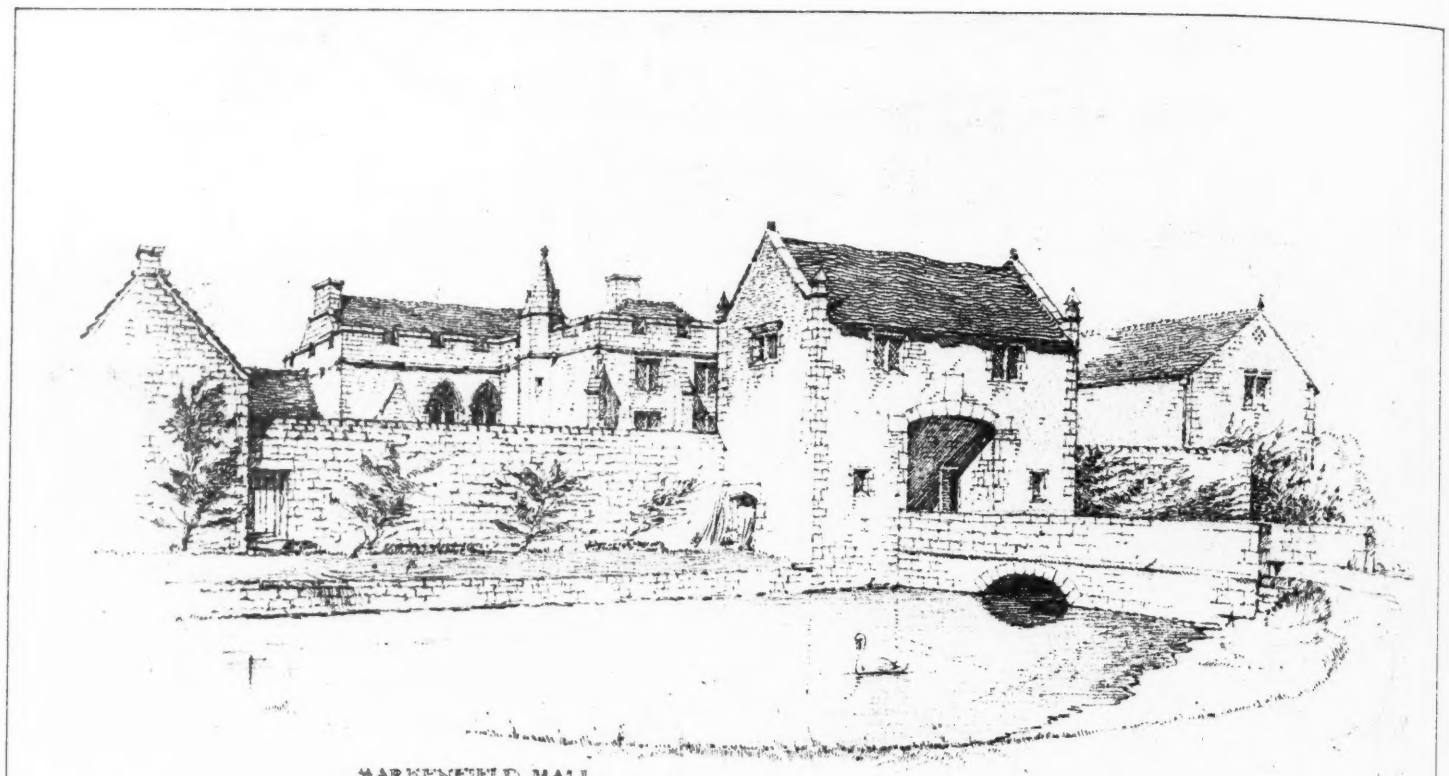
d, delivered
n at rly. dpt.

	s. d.
gons, ...	1 6½
Elms	1 8½

Sprague & Co., Ltd., Printers, 4 & 5 East Harding St., E.C.

CHINESE PAINTINGS:

No. 39—KWANYIN, THE GODDESS OF MERCY. YÜAN DYNASTY.

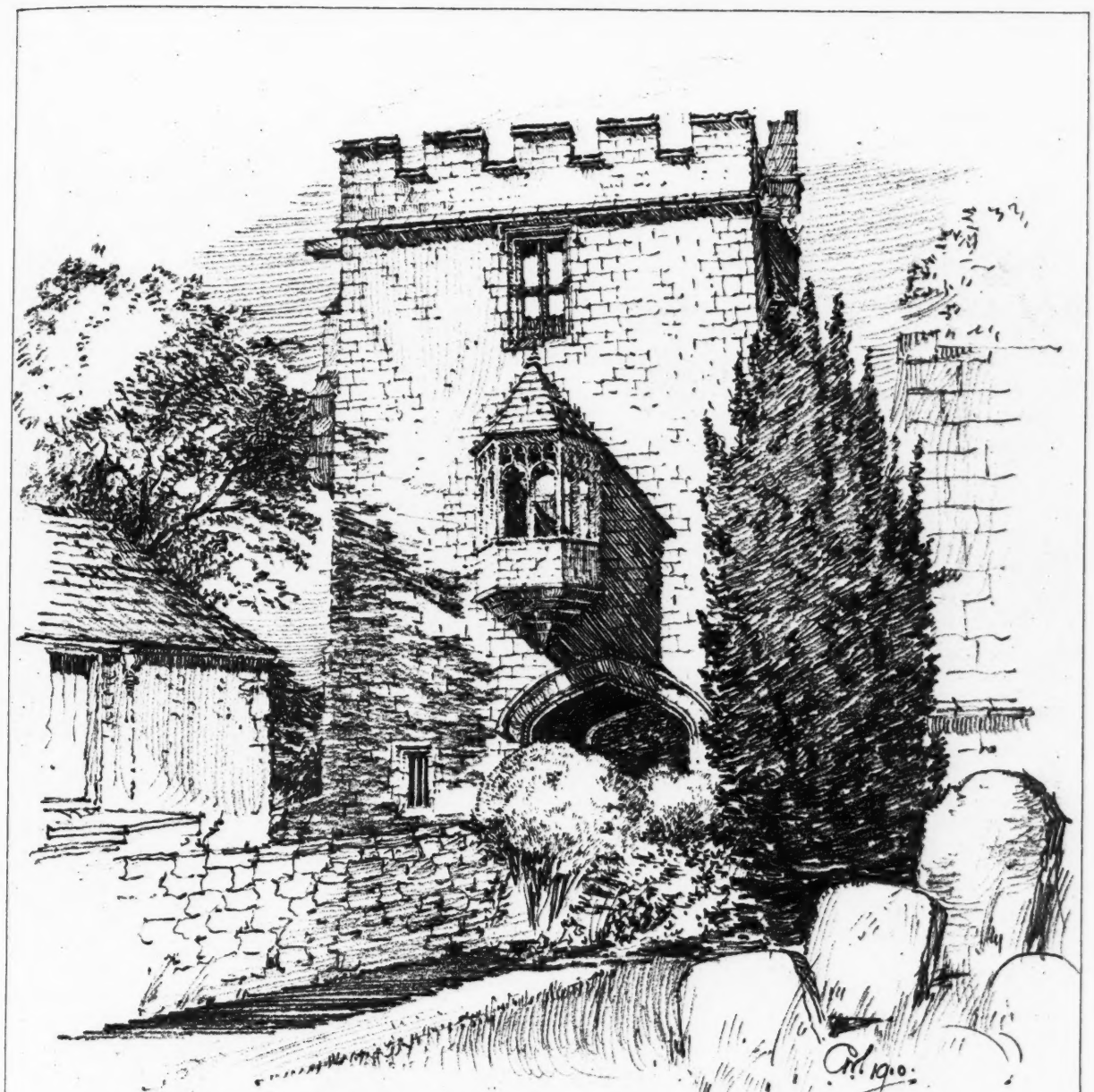


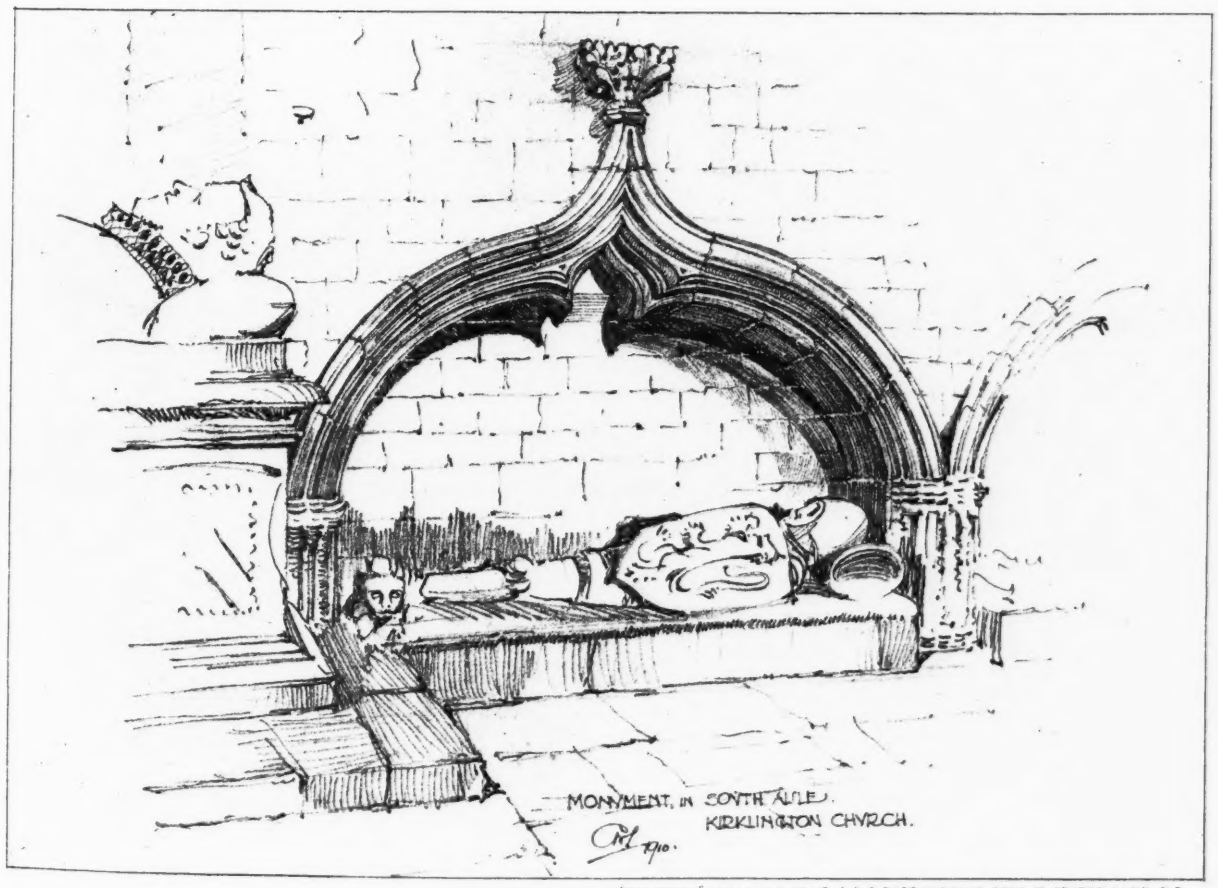
MARKENFIELD HALL.

THE TREASURER'S HOUSE, YORK.
FROM THE COURTYARD.

"INK-PHOTO" SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE E.C.

SKETCHES WITH THE ARCHITECTURAL ASSOCIATION EXCURSION.





"INK-PHOTO" SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE E.C.

SKETCHES WITH THE ARCHITECTURAL ASSOCIATION EXCURSION.

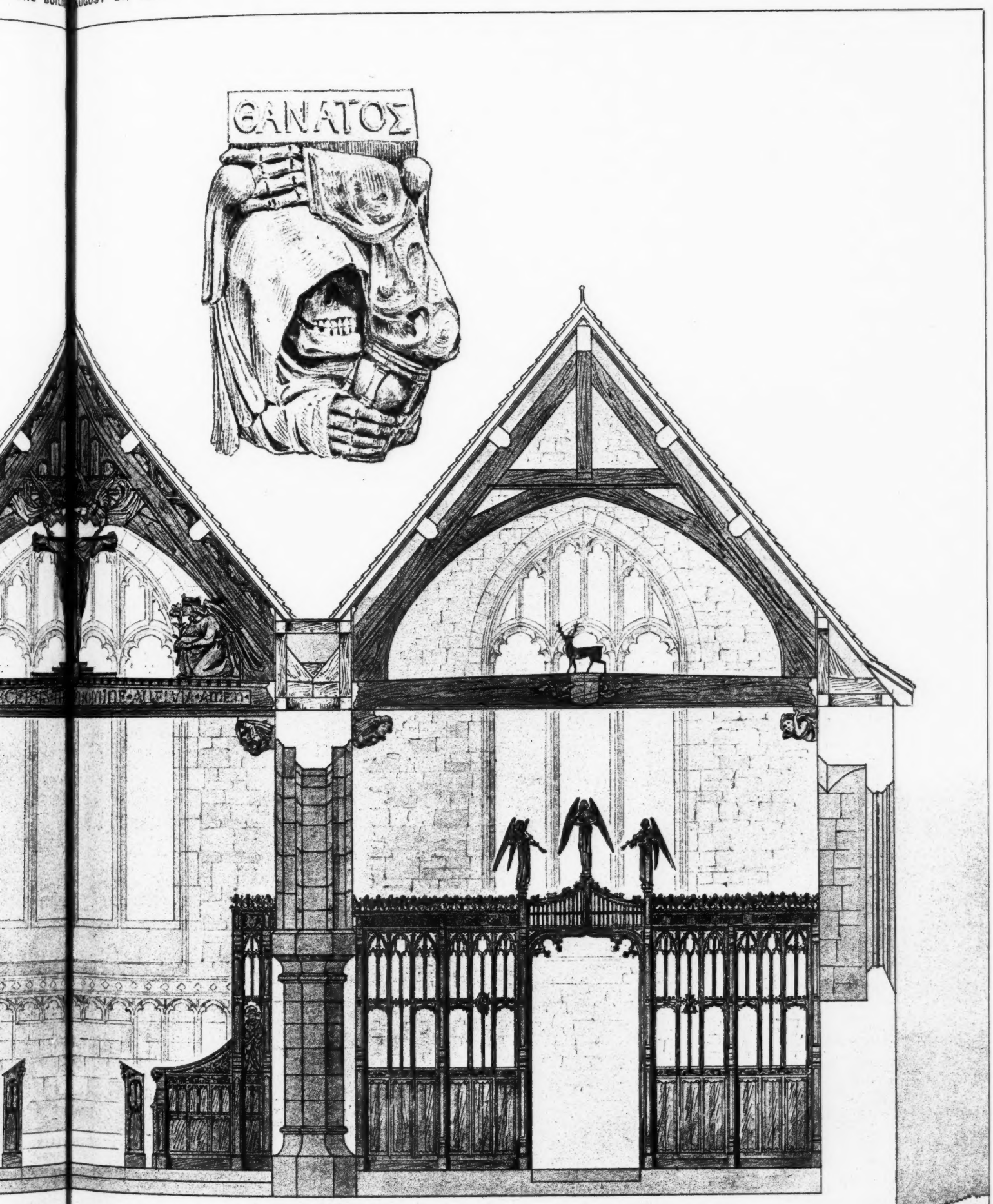
Sprague & Co., Ltd., Printers, 4 & 5 East Harding St., E.C.

CHINESE PAINTINGS:

No. 61.—TIGER. MING DYNASTY.

Church of St Peter, S

New roof and Chanc



of St Peter. Shorwell I.W.

roof and Chancel Screens.

Percy J. Stone inv.t et del.t

INK-PHOTO. SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.